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Audubon Field Notes

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THIRTEENTH BREEDING-BIRD CENSUS

Volume 3, No. 6 December 1949

AUDUBON FIELD NOTES

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Cover photograph of Chestnut-sided Warbler by Allan D. Cruickshank. [A species characteristic of young second-growth deciduous forest in the northeastern states. (See Censuses 9 and 10.)]

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Symbols and abbreviations: The first number appearing after each species is the density in pairs per 100 acres; this is followed in parentheses by the actual number of pairs in the study areas, segregated according to nesting evidence. P = pair; M = male, generally singing on a fixed territory throughout the season; UM = unmated male; F = female; N = pair for which one or more nests were found; Y = pair seen feeding young; EP = equivalent pair (used for cowbirds and polygamous species). Species are arranged in the order of decreasing abundance.

THIRTEENTH BREEDING-BIRD CENSUS

With the publication of the thirteenth series of breeding-bird censuses it may be said that our knowledge of the breeding-bird populations in North America is much greater than it was at the inception of this program in 1937. We now have considerable information on the populations to be found in many of the climax communities and in some of the seral stages as well. We also have a much better understanding of edge effect, of yearly variation in bird populations, and of the effects of certain land-use practices on breeding birds. However, there is still much to be done. There are many, many habitats that have not been touched by the census-taker. Because of this it might not be amiss to emphasize some of the reasons for conducting these studies, in the hope that more readers may be enticed to cooperate with us in pursuit of the objectives. These are listed as follows:

I. To determine the species and density of breeding birds to be found in each habitat type throughout North America.

II. To determine the effects of various land-use practices, *i.e.*, cutting timber, grazing, drainage, etc., on breeding-bird populations.

III. To determine the amount of yearly variation in densities of breeding birds occupying various habitat types.

IV. To determine the nesting habitat requirements for each species of bird, throughout its range.

This type of field work is indeed fascinating and enjoyable and is well worth the time that any ornithologist (amateur or professional) may be able to put into it.—ROBERT E. STEWART.

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1. Western Plains Dryland Field. The crop type was wheat (*Triticum aestivum*), no other vegetation being present to a major degree. SIZE: 25 acres. LOCATION: About 7 miles east and 3 miles south of Fort Collins, Colorado. Tract bounded on all sides by same type. TOPOGRAPHY: Nearly flat; elevation, about 4900 feet. EDGE: Boundary of area 125 feet from nearest edge. COVERAGE: May 14, 23, 30; June 10, 16, 17; July 9, 15, 24; August 2. Hours varied from 5 a.m. to 9 p.m., and totaled 17. CENSUS: Ring-necked Pheasant, 6 (1.5 EP). TOTAL: 1 species; density, 6 pairs per 100 acres. VISITORS: Marsh Hawk and Red-wing.—MEREDITH J. MORRIS, Zoology Dept., Colorado A. & M. College, Fort Collins, Colo.

2. Western Plains Irrigated Field. The crop type was Oats (*Avena sativa*), no other vegetation being present to a major degree. SIZE: 25 acres. LOCATION: About 7 miles east and 4 miles south of Fort Collins, Colorado. Tract bounded on all sides by same type. TOPOGRAPHY: Nearly flat; elevation, about 4900 feet. EDGE: Boundary of area 150 feet from nearest edge. COVERAGE: Same as above. CENSUS: Ring-necked Pheasant, 4 (1 EP). TOTAL: 1 species; density, 4 pairs per 100 acres. REMARKS: Grain fields in dryland furnish better nesting cover than irrigated fields for pheasants as the disturbance of irrigation is not present. A fairly large number of pheasant nests have been observed which were abandoned due to flooding at the time of irrigation. Other species of birds do not use grain fields as nesting sites to any great extent in this region.—MEREDITH J. MORRIS, Zoology Dept., Colorado A. & M. College, Fort Collins, Colo.

3. Apple Orchard. SIZE: 15 acres (rectangular, 110 yards by 660 yards). LOCATION: Bordering Route No. 7, midway between Jones Springs and Shanghai, Berkeley County, West Virginia. Elevation, 600 ft. VEGETATION: A typical mature apple orchard with uncut mixed grasses and forbs between the trees. Little other vegetation. Orchard had been sprayed regularly, though spraying dates and types of sprays were not determined. Coverage: June 14-18; 11 man-hours. CENSUS: Indigo Bunting, 44 (6½P); Field Sparrow, 27 (4P); Chipping Sparrow, 20 (3P); Am. Goldfinch, 13 (2P); Eastern Wood Pewee, 10 (1½P); Eastern Bluebird, 7 (1P); Blue-gray Gnatcatcher, 7 (1P); Cedar Waxwing, 7 (1P); Prairie Warbler, 7 (1P); Yellow-throat, 7 (1P); Crested Flycatcher, 3 (½P); Wood Thrush, 3 (½P); Yellow-breasted Chat, 3 (½P); Summer Tanager, 3 (½P); Bob-white, + (+P); Yellow-billed Cuckoo, + (+P); Carolina Chickadee, + (+P); Bewick's Wren, + (+P); Catbird, + (+P); Robin, + (+P); Red-eyed Vireo, + (+P); Brown-headed Cowbird, + (+P); Cardinal, + (+P); Eastern Towhee, + (+P). TOTAL: 24 species; 160 pairs per 100 acres. VISITORS: Sharp-shinned Hawk, Mourning Dove, Nighthawk, Chimney Swift, Ruby-throated Hummingbird, Yellow-shafted Flicker, Eastern Kingbird, Barn Swallow, Am. Crow, Starling, and Purple Grackle observed flying overhead.—W. R. DEGARMO, Conservation Comm., Charleston, W. Va.

4. Pine Barrens and Cedar Bog. The area (71 acres of Pitch Pine barrens and 4 acres of cedar bog) is located at Pine Lake Park, Toms River, New Jersey. It is off Route 37, approximately 3 miles south of Lakehurst, and was first censused in

1938. No forest fire has touched the tract since 1930, at which time the White Cedar bog now included in the area was practically wiped out. More than half the Pitch Pines were destroyed at the same time. By the time the census was started (1938), little regrowth had occurred, and only a few Coast White Cedars (*Chamaecyparis thyoides*) had appeared above the sphagnum moss of the bog. Now, in 1949, many of those cedars are 10 ft. high. The pitch pines destroyed have regrown, but have done so in such compact manner as to leave little or no open patches on the forest floor. Consequently, the ground cover is largely Blueberry (*Vaccinium*), Scrub Oaks (*Quercus prinoides, iticifolia,* and *marilandica*), Goat's Rue (*Cracca virginiana*), and Sweet Fern (*Comptonia asplenifolia*). This is especially good for the Eastern Towhee's breeding purposes. WATER: average depth in the cedar bog this year approximately 2 inches (one-third of the usual amount, the drop was due to the prolonged drought). Stream passing through bog averaged about 2 feet (approximately 1 foot lower than any other year). COVERAGE: April 24, 30, May 10, 31, July 15-21 daily. Total hours: 78. CENSUS [In this census, the figures in parentheses are not used to show the actual number of pairs in the study area—Ed.]: Eastern Towhee, 37 (28P, 5N, 22Y, 8UM); Prairie Warbler, 13 (10P, 1N, 8Y); Whip-poor-will, 4 (3P); Redwing, 4 (3P, 1N, 5Y); Mourning Dove, 3 (2P, 1N, 6Y); Eastern Kingbird, 3 (2P, 2Y); Eastern Wood Pewee, 3 (2P, 2Y); House Wren, 3 (2P, 1N, 6Y); Robin, 3 (2P, 4Y); Purple Grackle, 3 (2P, 8Y); Chipping Sparrow, 3 (2P, 1N, 5Y); Song Sparrow, 3 (2P); Bob-white, 1 (1P); Yellow-billed Cuckoo, 1 (1P); Nighthawk, 1 (1P); Ruby-throated Hummingbird, 1 (1P); Yellow-shafted Flicker, 1 (1P, 1N, 6Y); Downy Woodpecker, 1 (1P, 2Y); Crested Flycatcher, 1 (1P); Tree Swallow, 1 (1P, 1N, 5Y); Blue Jay, 1 (1P, 3Y); Am. Crow, 1 (1P, 6Y); Fish Crow, 1 (1P, 1N, 5Y); Carolina Chickadee, 1 (1P); Brown Thrasher, 1 (1P); Eastern Bluebird, 1 (1P); Cedar Waxing, 1 (1P); Black and White Warbler, 1 (1P); Pine Warbler, 1 (1P); Oven-bird, 1 (1P); Brown-headed Cowbird, 1 (1EP); Am. Goldfinch, 1 (1P); Field Sparrow, 1 (1P). TOTAL: 35 species; total pairs, 89; density, 118 pairs per 100 acres. COMMENT: A bulldozer went through a portion of the area near the cedar bog in what apparently was to be an attempt to cut streets through to expand the summer community of which this census tract is a part. Efforts were abandoned in April. There seemed to be little harmful effect upon the birdlife this year, but what may happen in the future if the planned expansion continues, I do not know. It is possible that the census tract may go the same way that so much of the pine barrens have gone since the end of the last war—cleared to erect summer homes. The Eastern Towhee is still increasing slowly in comparison with figures of a decade ago, probably due to regrowth of the Pitch Pines and Scrub Oaks. Together, the pines and oaks make an impenetrable thicket in many places. This is beneficial for the towhee, but not for the Pine Warbler which is showing regular decline in the census area. The Cedar Waxwing appeared as a breeder for the first time although it has been present in nearby woods off and on for fifteen years. Available nesting sites for the bluebird are decreasing. After the fire many old stumps with nesting cavities existed and the bluebird was as common here as anywhere in New Jersey. Now, with most of the dead stumps gone, only a few abandoned woodpecker cavities remain for the bluebird to use, and it has declined sharply in numbers.—DAVID FABLES, 421 Walnut Street, Roselle Park, N. J.

5. Climax Red and White Spruce Forest With Clearing. The area of 30 acres, called Audubon Peninsula on Hog Island, Muscongus Bay, **Maine (site of the Audubon Nature Camp)**, consists of 25 acres of climax spruce and 5 partially cleared acres containing buildings, Gray and White Birches, bushes, ferns and young spruce. Described in detail in earlier reports and censused from 1936 through 1942 and again in 1946 and 1947 (last census not published). Since the 1946 report many spruce halfway down the eastern shore of the peninsula were blown down by a heavy windstorm. COVERAGE: Several hours almost daily from mid-June to late August by two census takers plus numerous assistants. Total over 160 man hours. WEATHER: The summer was exceptionally dry and hot. CENSUS: Parula Warbler, 33 (6N, 4Y); Black-throated Green Warbler, 33 (2N, 6Y, 2M); Myrtle Warbler, 27 (2N, 5Y, 1M); Song Sparrow, 23 (3N, 3Y, 1M); Golden-crowned Kinglet, 20 (1N, 5Y); Slate-colored Junco, 20 (3N, 3Y); Blackburnian Warbler, 17 (4Y, 1M); Olive-backed Thrush, 13 (3N, 1Y); Magnolia Warbler, 13 (1N, 3Y); Black-capped Chickadee, 10 (2N, 1Y); Red-breasted Nuthatch, 7 (2N); Robin, 7 (1N, 1Y); Hermit Thrush, 7 (1N, 1Y); Cedar Waxwing, 7 (2N); Am. Redstart, 7 (1N, 1Y); Ruby-throated Hummingbird, 3 (1N); Flicker, 3 (1N); Hairy Woodpecker, 3 (1N); Tree Swallow, 3 (1N); Am. Crow, 3 (1N); Winter Wren, 3 (1N); Starling, 3 (1N); Red Crossbill, 3 (1N). TOTAL: 23 species; density, 81 pairs or 270 pairs per hundred acres. COMMENT: Naturally many species not breeding on the peninsula were recorded. Transients were most conspicuous in August. Being on an island numerous water birds (gulls, terns, ducks, guillemots, cormorants, shorebirds) were seen. Wide ranging birds such as herons, ravens, swallows and swifts were of regular occurrence. The vagrant population was variable. Such species as Nashville Warblers, Ovenbirds and Pine Siskins would often show up for a day or so and then move on. During the third week in June a great flight of crossbills reached our area. From then until the end of the summer both species were seen daily on our peninsula. The White-wings predominated, flocks of thirty or more often being present. The birds sang almost incessantly, males were seen going through their aerial

performances above the treetops and it is possible that both species bred on the peninsula. Finally, on August 22, Dr. John Arnett found a pair of Red Crossbills building a nest 60 feet up in a Red Spruce. The Winter Wren and Hairy Woodpecker, two new breeding species for our peninsula, were undoubtedly attracted by the dead trees and upturned roots left by the windstorm mentioned in the opening remarks.—ALLAN D. CRUICKSHANK and ROLAND CLEMENT, Audubon Nature Camp, Medomak, Maine.

6. White-Pine-Hemlock Forest. Tract of 50 acres of steep hillside culminating in a ridge with many outcropping ledges, described in 1939. Since the hurricane of Sept. 21, 1938, natural reforestation has made steady progress. Deciduous trees have in many places reached a height of 25 to 30 feet and conifers are appearing even in those tracts that were swept clear. Man's axe has hardly touched the area during the past year. LOCATION: Wells River, Vt. Area bounded by forest land on most of one side where timber was removed 17 years ago. Other boundaries are the Wells River, a railroad right of way, and open pasture. COVERAGE: June 15, 22, 30; July 6, 13, 20, 25; supplemented by almost continuous observation throughout the season. Total, 60 hours. CENSUS (* indicates permanent resident): Robin, 24 (2N, 10Y); Canada Warbler, 24 (1N, 7P, 4Y); Veery, 18 (9P); Ovenbird, 18 (7P, 2Y); White-throated Sparrow, 18 (1N, 4P, 4Y); Black-throated Green Warbler, 16 (8Y); Hermit Thrush, 14 (1Y, 6P); Red-eyed Vireo, 14 (7P); Black and White Warbler, 12 (1P, 5Y); Magnolia Warbler, 12 (6Y); Chestnut-sided Warbler, 12 (2P, 4Y); Am. Redstart, 12 (1N, 1P, 4Y); *Black-capped Chickadee, 10 (1P, 4Y); Black-throated Blue Warbler 10 (5Y); Eastern Wood Pewee, 8 (2P, 2Y); Cedar Waxwing, 8 (4P); Solitary Vireo, 8 (4P); Slate-colored Junco, 8 (3P, 1Y); Chipping Sparrow, 8 (4Y); Yellow-shafted Flicker, 6 (3Y); Winter Wren, 6 (3P); Blackburnian Warbler, 6 (3Y); Purple Finch, 6 (3Y); Am. Goldfinch, 6 (3P); Song Sparrow, 6 (1P, 2Y); *Ruffed Grouse, 4 (2Y); Yellow-bellied Sapsucker, 4 (2Y); Crested Flycatcher, 4 (1N, 1Y); Olive-sided Flycatcher, 4 (2P); *Blue Jay, 4 (2Y); *Am. Crow, 4 (2P); Wood Thrush, 4 (2P); Nashville Warbler, 4 (2P); Myrtle Warbler, 4 (2Y); Mourning Warbler, 4 (2P); Scarlet Tanager, 4 (1P, 1Y); Broad-winged Hawk, 2 (1Y); Sparrow Hawk, 2 (1N); Saw-whet Owl, 2 (1P); Whip-poor-will, 2 (1P); Ruby-throated Hummingbird, 2 (1P); *Hairy Woodpecker, 2 (1P); *Downy Woodpecker, 2 (1Y); *Red-breasted Nuthatch, 2 (1Y); Parula Warbler, 2 (1Y); Yellow-throat, 2 (1Y); Rose-breasted Grosbeak, 2 (1P). TOTAL: 47 species, 178 pairs; density, 356 pairs per 100 acres. FREQUENT VISITORS: Ruffed Grouse, 1Y; Yellow-bellied Sapsucker, 1Y; Hermit Thrush, 1P; Black-throated Blue Warbler, 1Y; Black-throated Green Warbler; 1Y; Oven-bird, 1Y; Canada Warbler, 2Y. COMMENT: It is hard to explain the decrease in numbers of the Blackburnian Warbler. There has been no change in the number of hemlocks. An apparent decrease in numbers for the species throughout the locality has been observed throughout the season, however.—WENDELL P. SMITH, Wells River, Vt.

7. Virgin Hemlock Forest. SIZE: 20 acres. LOCATION: Swallow Falls State Park, 6 miles north of Oakland, Garrett Co., Md. TOPOGRAPHY: The entire area slopes toward the Youghiogheny River on the east. Toliver Run traverses the study area near its southern edge without causing any break in the understory or canopy. Elevation 2200 to 2310 ft. EDGE: Bounded on the east by a narrow strip of more open forest with dense undergrowth, bordering the Youghiogheny River; on the south by the Thayerville road; on the west by the entrance road to the park, on the far side of which is mature forest, mainly deciduous; and on the north by an irregular line marking the furthest extent of solid hemlock stand. VEGETATION: Nearly the entire area was covered by an unbroken canopy of virgin Hemlock, though the Hemlock varied in size from one part of the area to another, with corresponding slight changes in the undergrowth. The mean DBH of Hemlocks 6 inches or over in four separate transects was 10, 20, 21, and 26 inches, with the largest tree in each transect measuring 35, 32, 30, and 39 in., respectively. The average species composition of the canopy in four 30-foot wide transects totaling 3000 ft. was: Hemlock (*Tsuga canadensis*), 68%; Yellow Birch (*Betula lutea*), 11%, Sugar Maple (*Acer saccharum*), 8%; White Pine (*Pinus strobus*), 5%; Northern Red Oak (*Quercus borealis*), 3%; White Oak (*Quercus alba*), 3%; miscellaneous, 2%. Understory, where present, consisted primarily of Hemlock, Yellow Birch, and Sugar Maple, or of Rhododendron (*Rhododendron maximum*). No single herbaceous plant was characteristic of the entire area, but ferns (including *Osmunda cinnamomea, Dryopteris noveboracensis, Adiantum pedatum,* and *Dryopteris marginalis*) were conspicuous in many places. In addition to various mosses and lycopodia, other plants present in parts of the area included *Maianthemum canadense, Mitchella repens, Trillium* sp., and various asters and violets. COVERAGE: June 11, 12, 13, 25. Total, 9 trips; about 1¾ hr. each, excluding observations made while mapping the area and searching for nests, and excluding one night when 2 observers camped at the edge of the area. CENSUS: Blackburnian Warbler, 110 (1Y, 21M); Magnolia Warbler, 80 (1N, 1Y, 1P, 13M); Black-throated Blue Warbler, 58 (1N, 1Y, 3P, 6½M); Black-throated Green Warbler, 30 (1Y, 1P, 4M); Solitary Vireo, 27 (2N, 2P, 1½M); Wood Thrush, 20 (2Y, 1P, 1M); Cedar Waxwing, 15 (3P); Scarlet Tanager, 10 (2M); Ruby-throated Hummingbird, 8 (1½M); Robin, 8 (1P, ½M); Veery, 8 (1Y, ½M); Parula Warbler, 8 (1½M); Canada Warbler, 7 (1P, ½M); Ovenbird, 5 (1Y); Northern Water-thrush, 5 (1Y);

Louisiana Water-thrush, 5 (1M); Brown-headed Cowbird, 5 (1Y); Mourning Dove, 2 (½); Blue Jay, 2 (½); Black and White Warbler, 2 (½M); Black-capped Chickadee, 1 (¼P); Turkey Vulture, +; Downy Woodpecker, +. TOTAL: 23 species, 416 pairs per 100 acres. VISITORS: Nighthawk, Yellow-shafted Flicker, Crested Flycatcher, Eastern Phoebe, Eastern Wood Pewee, Common Raven. COMMENT: This is the only tract of virgin Hemlock remaining in the state of Maryland. Due to its small size it was impractical to leave a strip of similar forest around the edge of the study area, and, therefore, some edge effect was introduced. The Phoebe and Nighthawk were listed as visitors, since they were evidently nesting on ledges along the Youghiogheny River, but frequently fed on or over the study area. Several other species typical of adjoining habitats were found on the edge of the area several times, but were omitted from this account since they were present only because of the proximity of the adjacent habitat. The very high density of breeding birds in this virgin forest compares favorably with that in a Virgin Central Hardwood Deciduous Forest in Maryland (437 pairs per 100 acres in 1947), and a Virgin Spruce—Northern Hardwood Forest in West Virginia (381 pairs per 100 acres in 1948). It is particularly interesting to note that the 3 commonest species in the West Virginia area were also commonest in the present area. Edgar M. Reilly, Jr., gave valuable assistance in mapping this irregular area, and Jerram Brown helped with the vegetation transects.—CHANDLER S. ROBBINS, Patuxent Research Refuge, Laurel, Md.

8. Red Pine Plantation. SIZE: 27½ acres. LOCATION: Herrington Manor, Swallow Falls State Park, 4 miles northwest of Oakland, Garrett Co., Md. TOPOGRAPHY: Gentle southeasterly slope on the northwest side of Herrington Lake. Elevation 2410 to 2440 ft. EDGE: Bounded on one-third of the perimeter by deciduous forest, on one-third by abandoned field, and on the remainder by small plantations of White Pine, Red and White Pine mixed, and young spruce, and by deciduous thicket. VEGETATION: Five adjoining plantations of Red Pine (*Pinus resinosa*), ranging in size from 3 to 9 acres, and separated from each other and from the surrounding vegetation by fire lanes of various widths. The pines were planted at 6-ft. intervals, are of uniform height, about 20 ft., and have diameters ranging from 4 to 6 in. DBH. COVERAGE: May 28, 29; June 12, 13, 26. Total, 6 hours in early morning and in evening, plus one mid-day visit, and two nights spent within hearing distance of the area. CENSUS: Magnolia Warbler, 22 (2Y, 4M); Cedar Waxwing, 15 (4P); Robin, 13 (2½P, 1M); Black-throated Green Warbler, 7 (1Y, 1M); Eastern Towhee, 7 (2M); Mourning Dove, 4 (1M); Veery, 4 (1P); Purple Finch, 4 (1M). TOTAL: 7 species; 75 pairs per 100 acres. VISITORS: Yellow-throats nested in the widest grassy fire lane and occasionally took cover in the pine, as did Field Sparrows, Song Sparrows, Catbirds, and other species which were nesting in adjacent habitats. COMMENT: The Mourning Doves and Robins fed almost entirely outside the area.—CHANDLER S. ROBBINS, Patuxent Research Refuge, Laurel, Md., and IRSTON R. BARNES, Washington, D. C.

9. Partially Cut-over Northern Hardwood Slope. The 23 acres showed the least change of any year since the first census in 1943. Raspberries and blackberries were plentiful and served to attract second and third broods and post-breeding families. LOCATION: New Hampton, N. H., one-half mile south of village. EDGE: Brush piles in small cut-over plots fully surrounded by 6-foot saplings serving to attract a Mourning Warbler which may have nested there though it sang more often from old location on study area. COVERAGE: April 9, 16, 28; May 4, 5, 8, 11, 12, 13, 14, 15, 26; June 9, 10, 12, 15, 23, 25; July 1, 7, 9, 12; August 1, 15. Total, 36 hours with one night trip. Other study periods averaged 8:30 to 10:30 a.m. WEATHER: The second successive very dry autumn left little moisture in the ground for 1949 growth. The only heavy rainfall occurred on the last three days of December removing all snow cover. Frost had penetrated to a depth of 6 inches under sod at the year's end with even less in the woodlands. Little snow fell all winter and again no crusts periled grouse and other birds. Below average rainfalls in March and April with practically none in May, June, or July made precarious water supplies. CENSUS: Chestnut-sided Warbler, 50 (5.5Y, 6P); Veery, 35 (4Y, 3.75P); Black-throated Blue Warbler, 33 (3Y, 3.5P, 1M); Red-eyed Vireo, 26 (3Y, 3P); Oven-bird, 26 (2Y, 4P); Eastern Wood Pewee, 17 (3Y, 1P); Black-throated Green Warbler, 15 (3.5Y); Black-capped Chickadee, 13 (3Y); Hermit Thrush, 13 (2Y, 1P); Yellow-throat, 13 (3Y); Canada Warbler, 13 (1.8Y, .6P, 1M); Black and White Warbler, 11 (2.5Y); Redstart, 11 (1Y, 1.5P); Ruffed Grouse, 9 (2P); Yellow-bellied Sapsucker, 9 (2Y); White-throated Sparrow, 9 (2Y); Purple Finch, 8 (1.75Y); Scarlet Tanager, 5 (.85Y, .4P); Indigo Bunting, 5 (1Y, 1M); Ruby-throated Hummingbird, 4 (1F); Hairy Woodpecker, 4 (1N); Blue Jay, 4 (1Y); Robin, 4 (1Y); Cedar Waxwing, 4 (1P); Solitary Vireo, 4 (1Y); Yellow-shafted Flicker, 3 (.75P); Crested Flycatcher, 3 (.75P); Rose-breasted Grosbeak, 3 (.75P); Mourning Warbler, 3 (.75P). TOTAL: 29 species; density 364 pairs per 100 acres. VISITORS: (Average number of individuals per 100 acres); Blackburnian Warbler, 17; Red-shouldered Hawk, 4; Broad-winged Hawk, 4; Pileated Woodpecker, 4; White-breasted Nuthatch, 4; Red-breasted Nuthatch, 4; Parula Warbler, 4; Bobolink, 4; Least Flycatcher, 2; Wood Thrush, 2; Nashville Warbler, 2; Myrtle Warbler, 2; Eastern Towhee, 2; Slate-colored Junco, 2. REMARKS: Indications pointed to more second and third broods than usual. Known second broods (or possibly very late first) include Eastern Wood Pewee, Black-capped Chickadee, Robin, Hermit Thrush, Solitary

Vireo (June 25 to July 12), Red-eyed Vireo?, Black and White Warbler, Black-throated Green Warbler, Yellow-throats, Purple Finches, and White-throated Sparrow. I believe one of last year's Nashville Warblers tried to establish a territory in his old location but failed to attract a mate. Blackburnian Warbler listed as visitor as this species sang on June 12 at three different locations, indicating perhaps last of migration. Assumed hummingbird nested for female was constantly seen on five well-scattered visits and male occasionally observed. It now seems likely that the Yellow-bellied Sapsuckers had not left the area last year. A young male Chestnut-sided Warbler had one song that greatly resembled that of Mourning Warbler. It nested in close proximity to last year's Mourning Warbler. Foraging areas in acres for 1948 and 1949 averaged as follows: Chestnut-sided Warbler, .5; Veery, .65; Black-throated Blue Warbler, .7 in '48 to .5 in '49, as number of breeding pairs increased; Red-eyed Vireo, .4 and overlapping each other; Oven-bird, 1; Eastern Wood Pewee, .75; Black-throated Green Warbler, 1.5; Black-capped Chickadee, 3; Hermit Thrush, 1.75; Yellow-throat, 1; Canada Warbler, 1; Black and White Warbler, 2.5; Redstart, 1; Ruffed Grouse, 5?; Yellow-bellied Sapsucker, 2; White-throated Sparrow, 1; Purple Finch, 1.5; Scarlet Tanager, 5; Indigo Bunting, 1; Ruby-throated Hummingbird, 1; Hairy Woodpecker, 10; Blue Jay, 3 plus; Robin, 1; Cedar Waxwing, 2; Solitary Vireo, 1.5; Flicker, 10; Crested Flycatcher, 2.5; Rose-breasted Grosbeak, 2; Mourning Warbler, 1.5.—VERA H. WALLACE, New Hampton, N. H.

10. Mature and Lumbered Oak-Maple Ridge Forest. Comparison of four areas in various stages of disturbance along the summits of Negro and Backbone Mountains, Garrett Co., Md.

A. OPEN, SLASH AREA. Cutting of all marketable trees had just been completed. SIZE: 15 acres. LOCATION: Along summit of Negro Mountain, ½ mile south of Negro Mountain Fire Tower (3 miles west of Grantsville). TOPOGRAPHY: Gentle southerly slope, dropping off more sharply just beyond the eastern and western limits of the study area. Elevation 2980 to 3040 ft. EDGE: A 100-foot strip of similar habitat separates this area from Area B on the north; most of the remainder of Area A is surrounded by similar habitat, although one corner of a field approaches within 25 ft. at the southeastern edge of the area. VEGETATION: 16 trees per acre with 6 in. DBH or more (computed from 2000 ft. transect, 15 ft. wide), of which 45% were Red Oak (*Quercus borealis*), with average DBH 14 in.; 45% Red Maple (*Acer rubrum*), with average DBH 11 in.; and 10% Yellow Birch (*Betula lutea*), DBH 8 in. Prominent among the sprouts, saplings and shrubs were Red Maple, Red Oak, Chestnut (*Castanea dentata*) and Witch Hazel (*Hamamelis virginiana*). Blackberry vines (*Rubus* spp.) were abundant. The most common herbaceous species were Fourleaf Loosestrife (*Lysimachia quadrifolia*), Cinnamon Fern (*Osmunda cinnamomea*), and New York Fern (*Dryopteris noveboracensis*). COVERAGE: May 28, 30; June 10, 11, 27. Nine trips totaling 4½ hours, plus one night trip for goatsuckers, and miscellaneous observations made while mapping, checking vegetation, or searching for nests. CENSUS: Chestnut-sided Warbler, 67 (1Y, 2P, 7M); Eastern Towhee, 33 (4P, 1M); Canada Warbler, 27 (1Y, 2P, 1M); Oven-bird, 20 (3M); Hooded Warbler, 17 (1P, 1½M); Black and White Warbler, 13 (2M); Yellow-throat, 13 (2Y); Red-eyed Vireo, 10 (1M, ½P); Black-throated Blue Warbler, 7 (1P); Yellow-breasted Chat, 7 (1P); Brown-headed Cowbird, 7 (1M); Indigo Bunting, 3 (½M); Scarlet Tanager, 2 (¼M); Yellow-billed Cuckoo, +; Whip-poor-will, +; Hairy Woodpecker, +; Crested Flycatcher, +; Eastern Wood Pewee, +. TOTAL: 18 species; 225 pairs per 100 acres. VISITORS: Crows occasionally flew over the area.

B. YOUNG SECOND GROWTH RESULTING FROM CUTTING. Dense understory; more mature trees still standing than in Area A. SIZE: 6¼ acres. LOCATION: Between Areas A and D, ¼ mile south of Negro Mountain Fire Tower. Elevation 3040 to 3060 ft. EDGE: Bounded by similar habitat on the east and west, by Area A on the south and Area D on the north. VEGETATION: 45 trees per acre with 6 in. DBH or more (computed from 825 ft. transect, 15 ft. wide), of which 31% were Red Oak, with average DBH 12 in.; 23% Red Maple, with average DBH 8 in.; 23% Yellow Birch, with average DBH 12 in.; and 23% Chestnut Oak (*Quercus montana*), with average DBH 12 in. Saplings, sprouts and herbaceous plants were essentially the same as in Area A, but with saplings larger and *Rubus* more restricted. COVERAGE: May 28, 30; June 10, 11, 27. Ten trips totaling 1½ daylight hours; also 2 night trips and ½ hour searching for nests. CENSUS: Black-throated Blue Warbler, 48 (2P, 1M); Hooded Warbler, 32 (2M); Canada Warbler, 32 (1P, 1M); Eastern Towhee, 32 (1P, 1M); Oven-bird, 24 (1½M); Red-eyed Vireo, 16 (1M); Black and White Warbler, 16 (1M); Chestnut-sided Warbler, 16 (1Y); Veery, 8 (½M); Yellow-billed Cuckoo, 4 (¼); Whip-poor-will, 4 (¼M); Scarlet Tanager, 4 (¼M); Rose-breasted Grosbeak, 4 (¼); Eastern Wood Pewee, +. TOTAL: 14 species; 240 pairs per 100 acres. VISITORS: A few Crows, flying over.

C. DENSE SECOND GROWTH. Far more trees of 5 in. and 6 in. DBH than all larger sizes combined; area had been cut over about 12 years earlier. SIZE: 21 acres. LOCATION: Crest of Backbone Mountain northeastward from Roth Rock Fire Tower between telephone poles 2 and 21; strip 330 ft. wide. TOPOGRAPHY: Ridge slopes gently to the northeast, but drops off abruptly on both sides just outside the study area. Elevation 3100 to 3320 ft. EDGE: Surrounded by similar habitat except for

350 ft. of mature deciduous forest at the base of Roth Rock Fire Tower (highest point in Maryland). VEGETATION: 78 trees per acre with 6 in. DBH or more (computed from 2850 ft. transect, 15 ft. wide), of which 47% were Red Maple, with average DBH 7 in.; 14% Red Oak, with average DBH 10 in.; 13% hickories (*Carya* spp.), with average DBH 11 in.; 9% White Oak (*Quercus alba*), with average DBH 12 in.; 5% Yellow Birch, with average DBH 10 in.; 5% cherry (*Prunus* sp.) with average DBH 8 in.; and 7% miscellaneous. The following were most conspicuous among understory and herbaceous plants: Red Maple, Red Oak, Chestnut, Black Locust (*Robinia pseudoacacia*), Staghorn Sumac (*Rhus typhina*), blackberries (*Rubus* spp.), and Hay-scented Fern (*Dennstaedtia punctilobula*). COVERAGE: May 29, 30; June 12, 13, 26. Nine trips totaling 7½ hours; also 2 nights spent in the area, and 3 hours spent searching for nests. CENSUS: Chestnut-sided Warbler, 79 (1N, 1P, 14½M); Red-eyed Vireo, 52 (1P, 10M); Canada Warbler, 45 (3P, 6½M); Eastern Towhee, 33 (5P, 2M); Hooded Warbler, 29 (6M); Oven-bird, 26 (5½M); Black and White Warbler, 21 (4½M); Indigo Bunting, 19 (1P, 3M); Golden-winged Warbler, 17 (1P, 2½M); Scarlet Tanager, 14 (1P, 2M); Mourning Warbler, 10 (1P, 1M); Crested Flycatcher, 7 (1P, ½); Black-capped Chickadee, 5 (1N); Brown-headed Cowbird, 5 (1M); Mourning Dove, 2 (½P); Ruby-throated Hummingbird, 2 (½M); Hairy Woodpecker, 2 (½); Blue Jay, 2 (½); Wood Thrush, 2 (½M); Black-throated Green Warbler, 2 (½M); Rose-breasted Grosbeak, 2 (½P); Pileated Woodpecker, 2 (⅓); Black-throated Blue Warbler, 2 (⅓M); Yellow-billed Cuckoo, +; Black-billed Cuckoo, +; Downy Woodpecker, +; Veery, +. TOTAL: 28 species; 373 pairs per 100 acres. VISITORS: Slate-colored (Carolina) Junco, 1 pair and young from adjacent mature oak-maple forest. Flying over, 1 Common Raven.

D. MATURE OAK-MAPLE RIDGE FOREST. SIZE: 12½ acres. LOCATION: Summit of Negro Mountain, 3 miles west of Grantsville. A 330-ft. strip extending 1150 ft. south and 1400 ft. northeastward from Negro Mt. Fire Tower, along the crest of the ridge; about half the study area lies within the Savage River State Forest. TOPOGRAPHY: The entire area slopes gently and evenly away from the fire tower. ELEVATION: 3010 to 3075 ft. EDGE: Surrounded by similar habitat except on the south edge where it bounds Area B. VEGETATION: A dense overstory of Red Oak and Red Maple forms a uniform canopy reaching to about 40 ft. from the ground; this canopy is broken only by the gravel road to the fire tower. Size and species composition of trees with a DBH of 6 in. or more, as determined by a 500 ft. transect 15 ft. wide was as follows: Red Oak, 68%, average DBH 9 in.; Red Maple, 23%, average DBH 8 in.; White Oak, 4%, average DBH 10 in.; Chestnut Oak, 3%, average DBH 6 in.; and miscellaneous, 2%, average DBH 8 in. Common understory and herbaceous plants in order of decreasing abundance were Red Maple, Cinnamon Fern, Witch Hazel, blackberries, Yellow Birch, Red Oak, Striped Maple (*Acer pennsylvanicum*), Wild Sarsaparilla (*Aralia nudicaulis*), Chestnut, and blueberries (*Vaccinium* spp.). COVERAGE: May 29, 30; June 12, 13, 26. Nine trips totaling 4½ hours, plus observations made while mapping and searching for nests, and 2 nights spent in the study area. CENSUS: Red-eyed Vireo, 44 (3P, 2½M); Black-throated Green Warbler, 36 (1P, 3½M); Oven-bird, 32 (1N, 3M); Robin, 8 (1N); Black-throated Blue Warbler, 8 (1M); Black and White Warbler, 4 (½M); Yellow-billed Cuckoo, 2 (¼); Scarlet Tanager, 2 (¼M); Broad-winged Hawk, +; Crested Flycatcher, +; Am. Crow, +; Wood Thrush, +. TOTAL: 12 species; 136 pairs per 100 acres.

COMMENT: A comparison of these 4 censuses gives an approximate idea of the changes in bird populations following lumbering of the oak-maple ridge forest. In 1910 Shreve (*The Plant Life of Maryland*) described both Negro Mountain and Backbone Mountain as being covered by second-growth forest, made up predominantly of Chestnut, Chestnut Oak, and Red Oak, which together formed 75% to 90% of the stands. Trees of secondary abundance at that time were White Oak, Shagbark Hickory (*Carya ovata*), Black Oak (*Quercus velutina*), Sweet Birch (*Betula lenta*), Sassafras (*Sassafras albidum*), Cucumber Tree (*Magnolia acuminata*), and Linden (*Tilia americana*); the last two he classed as uncommon. The Chestnut, of course, was destroyed by blight; in places it is fairly common in the understory, but comparatively few plants live long enough to produce burs. The percentage of oak, particularly the Chestnut Oak, has evidently been reduced by lumbering operations; and Red Maple, which is less profitable to the lumberman, is increasing in abundance. Bird populations in the uniform mature area are restricted both as to species and total individuals. Only 3 species, the Red-eyed Vireo, Black-throated Green Warbler, and Oven-bird are common in this type (see Mature Deciduous Forest on Burner Mt., West Virginia, *Audubon Field Notes*, Vol. 2, No. 6, p. 220. Nov. 1948, where the same 3 species were by far the most abundant). Species requiring undergrowth are either very scarce or absent.

In the freshly lumbered area (Area A) the avian population has changed completely. Occasional deformed "wolf trees" serve to retain a remnant of the former canopy-loving species, but the 3 species which formerly made up 82% of the population now constitute only 13%. The brush-loving Chestnut-sided Warbler has become the most abundant species by far, followed by the Eastern Towhee, Canada Warbler, and several other species requiring a shrub layer. The total population has risen 65%.

Figures for the next successional stage (Area B) must be construed only as a rough approximation of the bird population inasmuch as the area under

study was exceedingly small; they will help, however, to fill the gap between the freshly lumbered habitat and the more advanced stage. The principal changes are the disappearance of the Yellow-throat and Yellow-breasted Chat, and an abrupt increase in abundance of the Black-throated Blue Warbler.

In the more advanced second growth (Area C), both the number of species and pairs are at a peak. The original canopy species are rapidly returning, and at the same time most species characteristic of the preceding stage are still present in abundance. Natural succession in this area to the stage represented by Area A, will be considerably delayed since the presence of the "wolf trees," towering above the younger second growth will permit the entrance of light and the maintainance of scattered patches of shrubs and tangles for some time.

The small size of the areas has made it impossible to compare the abundance of the less common species such as cuckoos, woodpeckers, and flycatchers. Had each area contained 100 acres, the number of species in each type would probably have been from 10 to 50 per cent greater without changing the total density appreciably. The dense second growth area would still have had by far the greatest variety, and the uniform mature forest the least. The Robin in Area A was doubtless attracted in part by a planting of half a dozen Arbor Vitae (in one of which it nested) at the base of the fire tower; this species is not entirely atypical of the ridge habitats, however, and was recorded at other places along the ridge. The absence of the Mourning Warbler, and perhaps the Junco, from the Negro Mt. study areas may be due in part to the fact that nearly all of Negro Mountain is below 3000 ft. elevation. The Mourning Warbler, in particular, is restricted in Maryland to elevations above 3000 ft.; it is less common in Area C than it was 2 or 3 years ago, indicating that it is more typical of an earlier stage in the succession. I am indebted to Irston R. Barnes and Jerram Brown for assistance in mapping the area, measuring trees, and finding nests.—CHANDLER S. ROBBINS, Patuxent Research Refuge, Laurel, Md.

11. Intermediate Upland Southern Oak-Chestnut Forest. Forest canopy mostly closed with scattered thickets of Mountain Laurel (*Kalmia latifolia*) and Rhododendron (*Rhododendron catawbiense*) averaging 6 ft. in hight. Trees ranged from 50-75 ft. high and averaged 7 in. DBH. The largest hardwoods did not exceed 13.5 in. DBH, but a few White Pines (*Pinus strobus*) were 20-30+ in. DBH. Tree composition was: 23% White Oak (*Quercus alba*), 18% Black Oak (*Q. velutina*), 18% Chestnut Oak (*Q. montana*), 13% White Pine, 10% Red Oak (*Q. rubra*), 8% Red Maple (*Rufacer rubrum*), 5% Chestnut (*Castanea dentata*), and 5% Hickory (*Hicoria* spp.); oaks composed 69% of the total trees. The herb layer was composed principally of two species: Buckberry (*Decachaena ursina*) and Galax (*Galax aphylla*). There were several small granite outcrops on the area. Increment bores indicated that the age of the oldest White Pines approximated 100 years, but the hardwoods averaged only about 50 years (one large Black Oak was 95 years old). There was no evidence of disturbance by man. Botanical nomenclature follows Small's manual. SIZE: 10 acres. LOCATION: Highlands, Macon County, N. C. Tract bordered on two sides by roads, by a field on another, and by more mature forest on the fourth side. TOPOGRAPHY: Mostly level, but gently sloping downward toward the roads; elevation, 4000 ft. COVERAGE: June 20, 22, 23, 24, 28, 29, 30. Hours from 9-12 a.m., and totaled 15. CENSUS: Black-throated Blue Warbler 120 (7Y, 2P, 3M); Catbird, 40 (3P, 1M); Solitary Vireo, 30 (3M); Towhee, 30 (2Y, 1P); Oven-bird 30 (2P, 1M); Black and White Warbler, 20 (2Y); Blue Jay, 10 (1P); Chestnut-sided Warbler, 10 (1P); Scarlet Tanager, 10 (1P); Chickadee, 10 (1P); Red-breasted Nuthatch, 10 (1P); Rose-breasted Grosbeak, 10 (1P); Junco, 10 (1P); Ruby-throated Hummingbird, 10 (1P); Flicker, 10 (1P). TOTAL: 15 species, 360 pairs per hundred acres. VISITORS: Brown Thrasher, Cedar Waxwing, Wood Thrush, Robin, Red Crossbill, and Indigo Bunting.—DAVID W. JOHNSTON, Dept. of Biology, University of Georgia, Athens, Ga.

12. Young Oak-Hickory Forest. The principal dominant trees are Shagbark Hickory (*Carya ovata*), Pignut Hickory (*C. glabra*), White Oak (*Quercus alba*), and Black Oak (*Q. velutina*). The largest of these trees are 12-14 in. DBH. A stand of Large-toothed Aspen (*Populus grandidentata*) covers about five per cent of the area. A few Quaking Aspen (*Populus tremuloides*) and several Black Cherry (*Prunus serotina*) are scattered throughout the area. Common subdominants in addition to the oak and hickory saplings are Witch Hazel (*Hamamelis virginiana*), Sassafras (*Sassafras albidum*), and Black Cherry saplings. Less abundant shrubs are Red Juniper (*Juniperus virginiana*), hawthorn (*Crataegus* spp.), huckleberry (*Gaylussacia baccata*), and Canada Blueberry (*Vaccinium canadense*). Common Juniper (*Juniperus communis*) occurs sparsely on the forest floor much of which is covered with a sedge (*Carex communis*). Plant nomenclature based on Deam, *Flora of Indiana*, 1940. SIZE: 20 acres (paced). LOCATION: Edwin S. George Reserve, Livingston Co., Michigan, 22 miles northwest of Ann Arbor. TOPOGRAPHY: A series of small, relatively dry, kettle holes; elevation, 900-985 ft. EDGE: Boundary of area 38 yards from nearest edge. COVERAGE: April 16, 30; May 14, 21, 28; June 3, 9, 24; July 1, 8, 12. Hours varied from 7:00 a.m. to 9:00 p.m. and totaled 29 man-hours. CENSUS: Cerulean Warbler, 50 (10M); Oven-bird, 40 (4P, 4M); Wood Pewee, 35 (7M); Red-eyed Vireo, 25 (5M); Least Flycatcher, 20 (1N, 3M); Yellow-throated Vireo, 20 (4M); Acadian Flycatcher, 15 (3M); White-breasted Nuthatch, 10 (1P, 1M); Scarlet Tanager,

DISTRIBUTION OF NORTH AMERICAN BIRDS

Chandler S. Robbins

In this issue we are presenting two additional preliminary maps depicting our knowledge of the distribution and abundance of North American rails. These have been prepared in the Section of Distribution and Migration of Birds of the United States Fish and Wildlife Service, from data in their bird distribution files. The first map shows the winter range of the North American race of the Virginia Rail (*Rallus limicola limicola*), and the second illustrates breeding, wintering, and migration records of the two subspecies of the Black Rail which occur in the A.O.U. Check-List area: *Laterallus jamaicensis pygmaeus* in the East, and *L. j. coturniculus* in the Pacific coastal states.

As in previous maps, the winter period has arbitrarily been chosen as the month of January in the South, and December 25 through February 7 north of California, Nevada, Utah, Colorado, Kansas, Missouri, the Ohio River, Maryland, and Delaware. Sight observations have been included only within the normal range of the species. Where both spring and fall observations were on record from a single locality, these have been indicated by adjacent symbols; where breeding or winter records were available, migration symbols have been omitted. In a few cases a single symbol has been used to represent records from two or more nearby localities.

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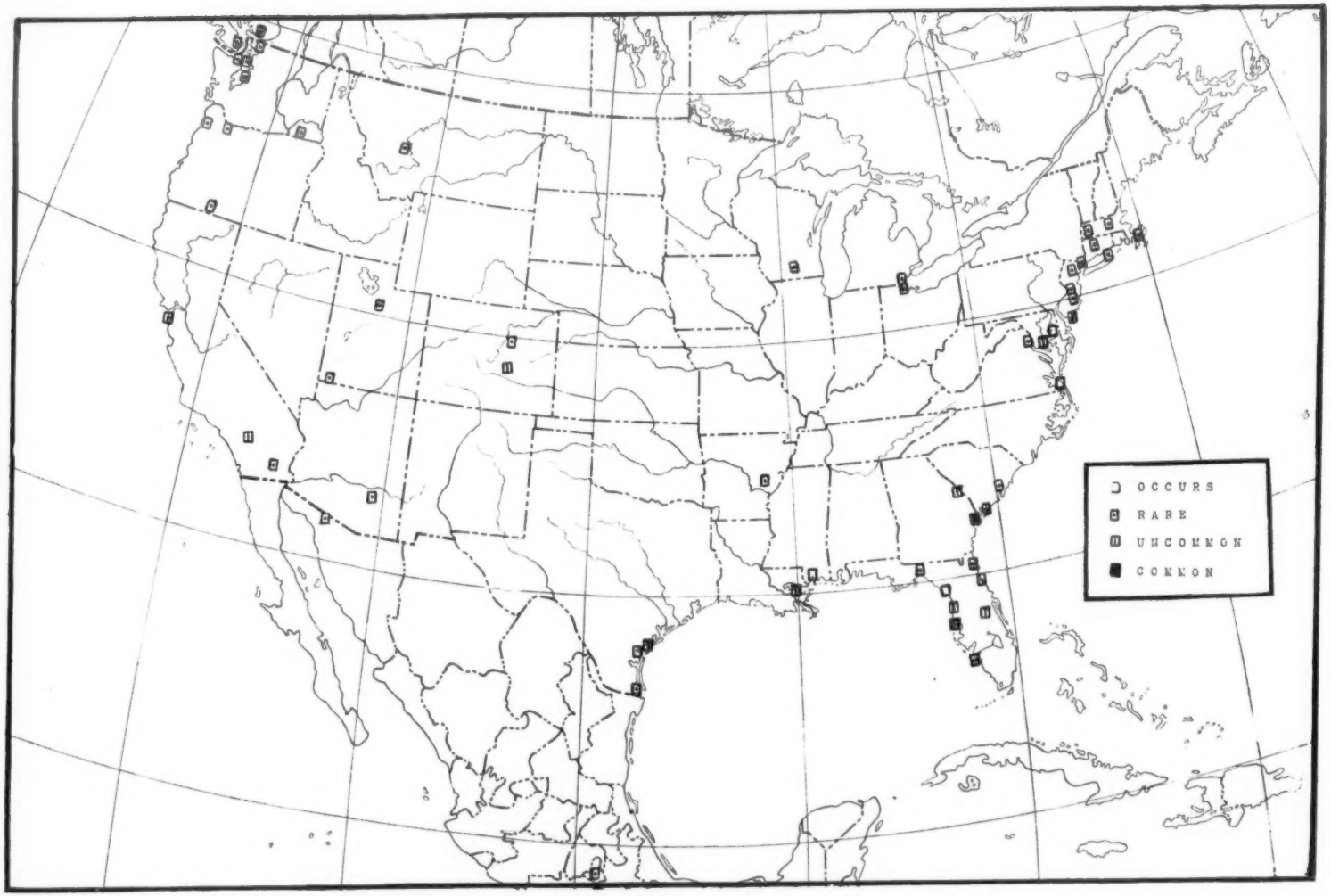
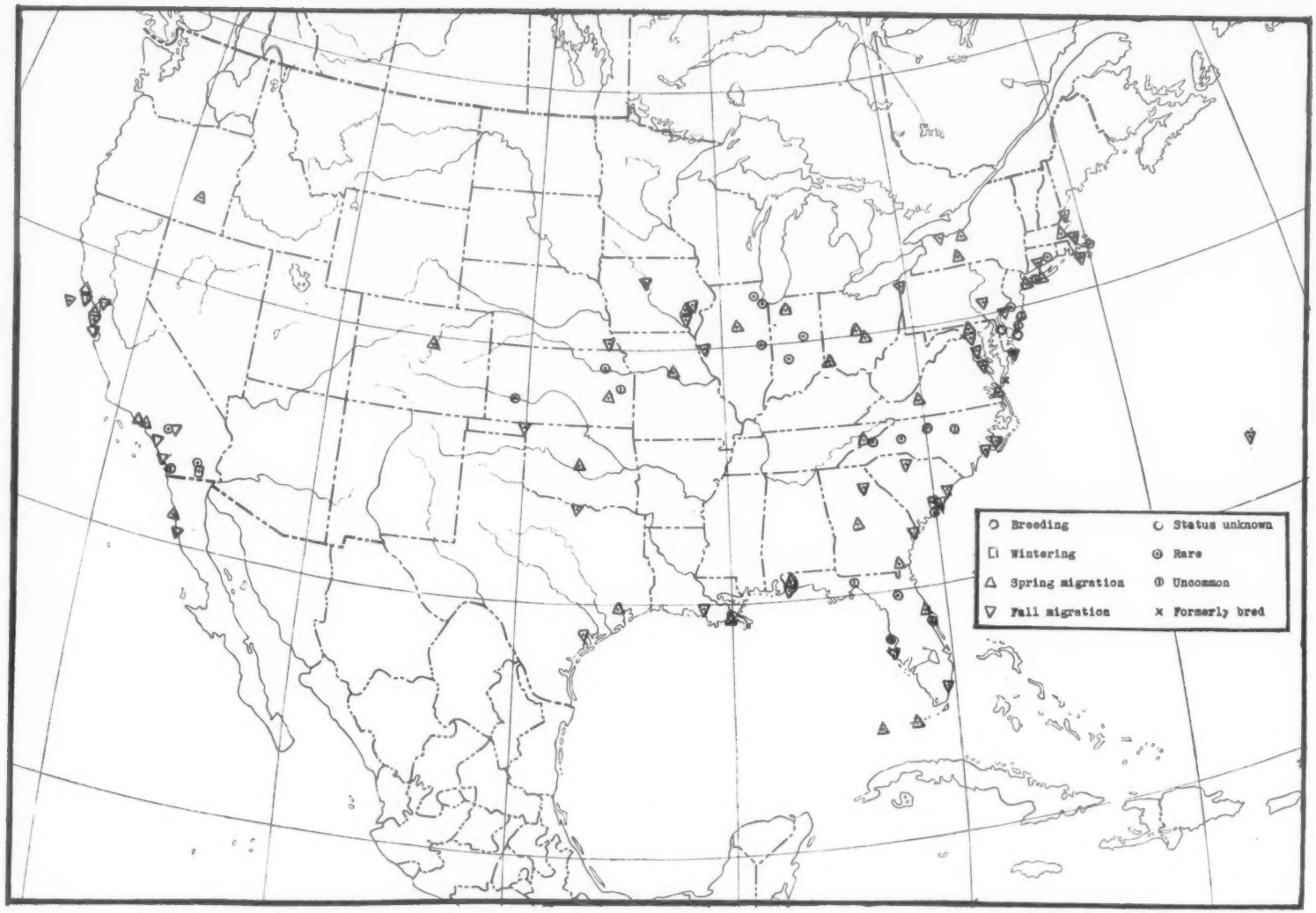
10 (1N, 1M); Ruby-throated Hummingbird, 5 (1N); Downy Woodpecker, 5 (1P); Crested Flycatcher, 5 (1M); Black-capped Chickadee, 5 (1Y); Tufted Titmouse, 5 (1Y); Veery, 5 (1N); Blue-gray Gnatcatcher, 5 (1P); Ruffed Grouse, + (+P); Yellow-billed Cuckoo, + (+M); Barred Owl, + (+Y); Whip-poor-will, + (+M); Hairy Woodpecker, + (+M); Brown-headed Cowbird (see remarks). TOTAL: 22 species; density (exclusive of Cowbirds), 260 pairs per 100 acres. VISITORS average density not determined): Black-billed Cuckoo; Blue Jay; American Crow; Cedar Waxwing; Black and White Warbler; Cardinal; Common Goldfinch; Field Sparrow. REMARKS: Cowbird activity was greatest in late May and early June. An average of two birds per census trip was recorded on May 21, May 28, June 3, and June 9; but none were seen on later trips.—DANA SNYDER, Museum of Zoology, University of Michigan, Ann Arbor, Mich.

13. Oak-Maple Forest and Forest-Edge. SIZE: 55 acres forest plus 1.25 miles of forest-edge. LOCATION: Trelease Woods, 6 miles northeast of Champaign, Illinois. DESCRIPTION OF AREA: See *Audubon Field Notes* 2, 1948:232-233. COVERAGE: April 9, 27; May 21; June 4, 12, 19, 27; July 16. Total man-hours, 38, all in the morning. REMARKS: Over half of the species here recorded nest in or at the edge of the Woods and feed mostly outside the Woods, as the Woods is completely surrounded by open country. The density of the true forest birds has been calculated, therefore, in terms of acres censused, but the density of these other species has been computed on the basis of miles of forest-edge. CENSUS, FOREST-INTERIOR SPECIES: House Wren, 110 (61); Indigo Bunting, 45 (25); Red-eyed Vireo, 29 (16); Crested Flycatcher, 16 (9); Eastern Wood Pewee, 14 (8); Yellow-billed Cuckoo, 11 (6P); Downy Woodpecker, 9 (5); Tufted Titmouse, 7 (4); Red-bellied Woodpecker, 4 (2); Hairy Woodpecker, 2 (1); Horned Owl, 1 (1N); Acadian Flycatcher, 1 (1); Kentucky Warbler, 1 (1). CENSUS, FOREST-EDGE SPECIES: Starling, 14 pairs per mile (18); Am. Crow, 4 (5); Yellow-breasted Chat, 2 (2); Cardinal, 2 (2); Cooper's Hawk, 1 (1); Ruby-throated Hummingbird, 1 (1); Yellow-shafted Flicker, 1 (1); Red-headed Woodpecker, 1 (1); Blue Jay 1 (1); Robin, 1 (1); Yellow-throat, 1 (1); English Sparrow, 1 (1); Am. Goldfinch, 1 (1); Field Sparrow, 1 (1); Brown-headed Cowbird, present. TOTALS: 13 species in the forest-interior, density 250 pairs per 100 acres; 15 species on the forest-edge, density 32 pairs per mile. COMMENTS: The increase in numbers of House Wrens in recent years has been spectacular. In 1944 and 1945 there were 25 pairs recorded, in 1946—28 pairs, in 1947—32 pairs, in 1948—45 pairs, and this year—61 pairs. This appears to be a very high density, yet if the entire woods is utilized, there is available an average of 0.9 acre per pair, which is about the average size of territories in this species (Kendeigh, S. C., *Ill. Biol. Mono.* 18, 1941:41). This species has been known to tolerate compression of their territories to 0.6 acres. If this should occur in this woods, there would be a population of 92 pairs on these 55 acres. It will be interesting to see if the increase in density actually continues in future years.—S. CHARLES KENDEIGH and BEN J. FAWVER, Vivarium Bldg., Champaign, Ill.

14. Climax Beech-Maple-Hemlock Forest. A tract of approximately 65 acres, located in the North Chagrin Reservation of the Cleveland Metropolitan Park system, 16 miles east of Cleveland, Ohio. Study begun in 1932. Area fully described in previous reports. Coverage: April 26; May 5, 12, 19, 24, 26; June 3, 7, 11, 15, 25. TOTAL: 32 hours. CENSUS: Red-eyed Vireo 43 (5N, 2Y, 8P, 13M); Ovenbird, 37 (5N, 1Y, 12P, 6M); Wood Thrush, 32 (10N, 10P, 1M); Hooded Warbler, 18 (3N, 5P, 4M); Am. Redstart, 11 (1N, 3P, 3M); Acadian Flycatcher, 9 (1N, 5M); Eastern Wood Pewee, 9 (2N, 4M); Crested Flycatcher, 6 (1P, 3M); Black-capped Chickadee, 6 (1N, 3P); Cerulean Warbler, 6 (4M); Black-throated Green Warbler, 6 (4M); Scarlet Tanager, 6 (4P); Phoebe, 5 (3N); White-



Preliminary map showing the winter distribution of the Virginia Rail by Chandler S. Robbins.



Preliminary map showing the distribution of the North American races of the Black Rail by Chandler S. Robbins.

breasted Nuthatch, 5 (3P); Yellow-throated Vireo, 5 (3M); Hairy Woodpecker, 3 (2P); Downy Woodpecker, 3 (2P); Louisiana Water-thrush, 3 (2M); Cowbird, 3 (2N); Cardinal, 3 (2P); Pileated Woodpecker, 2 (1Y); Blue Jay, 2 (1P); Tufted Titmouse, 2 (1P); Rose-breasted Grosbeak, 2 (1P). Total 24 species; density, 226 pairs per 100 acres.—ARTHUR B. WILLIAMS, (Kirtland Bird Club), Cleveland Museum of Natural History, Cleveland, Ohio.

15. Beech-Maple Forest. SIZE: 20 acres. LOCATION: Henry County, six miles north of New Castle, Indiana, two miles east of Mt. Summit, Ind. DESCRIPTION OF AREA: A fairly mature second growth forest, rectangular in shape. This area is an Indiana Classified Forest; it represents a typical Henry County woodlot. This forest is one of the largest and best preserved of its kind in the county. It is surrounded on three sides by fields. One hundred feet was subtracted around the plot on these three sides to allow for edge effect. The fourth side is adjacent to another woods. The study area contains a variety of plants and shrubs. Dominant species of trees are as follows: Sugar Maple (*Acer saccharum*), beech (*Fagus grandifolia*), Tulip Poplar (*Liriodendron tulipifera*), Wild Cherry (*Prunus serotina*), hackberry (*Celtis occidentalis*) and Shagbark Hickory (*Carya ovata*). Poison Ivy is found abundantly along with wild grape vines. WATER: Three semi-permanent pools are found in the woods. These areas dried up somewhat but always remained swampy. The two streams that flowed during the winter season, were generally found dry during the summer months. CLIMATE: Average temperature during the breeding-bird census period was 68.3° F. Extremes were 82.5°—49°. Total precipitation, 5.86 in. COVERAGE: May 15, 18, 25, 29; June 2, 3, 14, 17, 20, 25; July 8, 12, 17. Total number of trips, 13. Average time spent on each trip, one hour and forty-three minutes. CENSUS: Red-eyed Vireo, 60 (11P, 1N); Acadian Flycatcher, 15 (3P); Eastern Wood Pewee, 15 (2P, 1Y); Kentucky Warbler, 10 (1P, 1N); Screech Owl, 5 (1P); Red-bellied Woodpecker, 5 (1N); Downy Woodpecker, 5 (1P); Tufted Titmouse, 5 (1P); Cardinal, 5 (1N). TOTAL: 9 species, 125 pairs per 100 acres. REMARKS: Possibly a pair of Whip-poor-wills nested in the woods. This could not be confirmed although several attempts were made to find the pair. White-breasted Nuthatch, Yellow-billed Cuckoo, Blue Jay, Crested Flycatcher, Flicker, and Scarlet Tanager were found in the woods; the presence of each bird was not frequent enough to indicate nesting. One pair of Starlings nested in the edge. Indigo Buntings and Field Sparrows sang in the edge during most of the census period. An immature Indigo Bunting being fed by a parent was seen on several occasions. Young Crows were fed by parents in the study area, but it is believed that no nesting actually took place in the woods. Goldfinches, Cowbirds, Black-crowned Night Herons, Chimney Swifts, and Crows were seen flying over the woods.—MARJORIE TAPSCOTT, 1109 Indiana Avenue, New Castle, Ind.

16. Mature Deciduous Flood-Plain Forest. A mature woodland on Cabin John Island, a tract of Potomac River flood plain at Glen Echo, Md., 2½ miles northwest of the District of Columbia, described fully in 1947, and reported in 1947 and 1948. SIZE: 18.75 acres. COVERAGE: April 17, 24; May 1, 8, 14, 21 (2 trips); June 4, 12, 26; July 1. Hours between 4:50 a.m. and 6:10 p.m. (50% before 8:30 a.m.) Total hours: 32 (observer hours, about 47). Ten trips complete; two covered half of area. WEATHER: January and February were both warmer than a normal March, with mean daily temperatures 10° and 9° F., respectively, above normal. March (4.5° above normal) through June averaged 3.3° above normal. Although the warm winter advanced the growth of many early plants several weeks, no unusually early breeding bird activity was noted. Precipitation in March was nearly normal, April and June were dry (61% and 45% of normal), and May was wet with 153% of normal precipitation (excess of 2 in.) and several violent storms. Total precipitation March through June was 91% of normal. The margin of the island, totaling about 4 acres, was flooded by the river several times in May and late June. (Data from U. S. Weather Bureau, Washington, D. C.). CENSUS: Red-eyed Vireo, 96 (2N, 3P, 13M); Parula Warbler, 80 (15M); Am. Redstart, 75 (2N, ½Y, 1P, 10½M); Acadian Flycatcher, 48 (2/2P, 7 2/2M); Cardinal, 24 (2N, 1½Y, 1M); Wood Thrush, 21 (1N, 1½P, 1½M); Wood Pewee, 19 (3½M); Tufted Titmouse, 19 (1Y, 2½M); Blue-gray Gnatcatcher, 19 (1N, 2½M); Red-bellied Woodpecker, 16 (1P, 2M); Carolina Chickadee, 16 (3Y); White-breasted Nuthatch, 16 (1Y, 2M); Carolina Wren, 16 (3P); Kentucky Warbler, 16 (2Y, 1P); Downy Woodpecker, 13 (2½P); Crested Flycatcher, 13 (1P, 3/2M); Yellow-throated Vireo, 13 (1Y, 1½M); Louisiana Water-thrush, 11 (1Y, 2/2M); Yellow-throat, 8 (1½M); Barred Owl, 5 (1P); Yellow-billed Cuckoo, 5 (1M); Ruby-throated Hummingbird, 5 (1F); Hairy Woodpecker, 5 (1N); Robin, 5 (1Y); Hooded Warbler, 5 (1N); Scarlet Tanager, 5 (1P); Pileated Woodpecker, 4 (¾N); Yellow-shafted Flicker, 3 (½M); Prothonotary Warbler, 3 (½Y); Song Sparrow, 3 (1½Y); Cowbird, 1 (1 female recorded: 1 egg in Hooded Warbler nest). TOTAL: 31 species. DENSITY: 588 pairs per 100 acres (517, 1947; 618, 1948). FEEDING OUTSIDE AREA: Starling, 75 (8N, 1Y, 5P); Wood Duck, 5 (1P); Am. Crow, 5 (1Y). FINAL TOTAL: 34 species; FINAL DENSITY: 673 pairs per 100 acres (608, 1947; 714, 1948). VISITORS (average number of adult individuals per 100 acres per trip, based on occurrence during probable seasons of residence of each species, to exclude migrants): Purple Grackle, 3; Blue Jay, 2; Green Heron, 1; Chimney Swift, 1; Belted Kingfisher, 1; Worm-eating Warbler, 1; Yel-

low Warbler, 1; Baltimore Oriole, 1; Summer Tanager, 1; Am. Goldfinch, 1. Total visitors: 10 species, 13 individuals per 100 acres. REMARKS: The Pileated Woodpecker's nest, from which three young emerged, May 26, was located 20 yards from the study area, which, however, comprised most of the pair's territory. Records for the four pairs of gnatcatchers indicate the necessity for many trips on the census area, as the pair whose nest was located was noted only once (June 4), while feeding large young in the nest. Another bird whose behavior indicated a nest in the vicinity was recorded only on that date and July 4. Birds in the other two territories, at the opposite end of the island, however, were recorded each during 5 trips, beginning May 8, and both on June 4. The Cowbird egg in the Hooded Warbler nest did not hatch, but the female warbler was seen feeding young out of the nest.—HAZEL BOWER, LILLIAN COVILLE, JOAN CRISWELL, ELLEN HOLWAY, NANCY JENISON, HELEN JOHNSTON, JEANNE STIVERS, DONALD THATCHER (Audubon Society of the District of Columbia).

17. Central Hardwood Forest with Scattered Pine. A sloping area of second-growth hardwood forest, principally of oaks, with 5 per cent of scattered pines, in Rock Creek Park, Washington, D. C., first reported and described fully in 1948. SIZE: 80 acres. COVERAGE: April 9 (part), 23; May 14, 30; June 11, 18; July 10. Hours between 4:45 a.m. and 1:50 p.m. (65% before 8:30 a.m.). Total hours: 24½. WEATHER: See accompanying study in flood-plain forest (Glen Echo, Md.). CENSUS: Red-eyed Vireo, 51 (7P, 1Y, 32 2/2M); Oven-bird, 43 (3½Y, 11P, 19½M); Acadian Flycatcher, 28 (2N, 1Y, 3P, 16M); Wood Thrush, 24 (6N, 1½Y, 4P, 8M); Yellow-throated Vireo, 8 (2½Y, 3½M); Scarlet Tanager, 8 (2P, 4½M); Eastern Wood Pewee, 6 (1P, 4M); Carolina Chickadee, 6 (1Y, 3P, 1M); Tufted Titmouse, 6 (1N, 3P, 1M); Downy Woodpecker, 4 (2N, 1P); Hooded Warbler, 4 (1Y, 1P, 1½M); Ruby-throated Hummingbird, 3 (2F); Crested Flycatcher, 3 (1P, 1M); White-breasted Nuthatch, 3 (1P, 1½M); Red-bellied Woodpecker, 2 (1½P); Hairy Woodpecker, 2 (1N, 1M); Am. Crow, (2P); Black and White Warbler, 2 (2M); Cardinal, 2 (1N, ½P); Barred Owl, 1 (1Y); Yellow-shafted Flicker, 1 (1P); Eastern Phoebe, 1 (1M); Kentucky Warbler, 1 (1Y); Cowbird, 1 (½P-Y). TOTAL: 24 species; DENSITY: 212 pairs per 100 acres (235 in 1948). VISITORS (average number of adult individuals per 100 acres occurring during probable season of residence, to exclude migrants): Robin, .8; Louisiana Water-thrush, .6; Blue Jay, .4; Yellow-throat, .4; Eastern Bluebird, .2; Am. Goldfinch, .2; Total: 6 species, 2.6 individuals per 100 acres. REMARKS: One Wood Thrush nest contained 8 eggs (with a ninth on the ground nearby), of which at least three hatched. The Tufted Titmouse nest was in an old woodpecker hole in the butt end of a broken-off dead limb suspended from the fork of a large tuliptree. The Cardinal nest (unsuccessful) was in the exact location of the one found in 1948. —DONALD M. THATCHER (for Audubon Society of the District of Columbia).

18. Mixed Oak Forest. A tract of culled hardwoods censused for the first time in 1948 and described in *Audubon Field Notes* 2:234, 1948. A winter bird count on the area has also been published (*Ibid.* 3:189, 1949) giving some additional details. SIZE: 40 acres. LOCATION: On the campus of Goucher College at Towson, Baltimore County, Maryland. COVERAGE: March 5, 19; April 2, 9, 14; May 13, 28; June 26; July 3. Hours between 4:10 a.m. and 2:15 p.m. EST, totaling 20 (9 trips). CENSUS: Red-eyed Vireo, 38 (15M); Oven-bird, 31 (12½M); Eastern Wood Pewee, 11 (4½M); Wood Thrush, 10 (4M); Tufted Titmouse, 5 (1N, 1P); Downy Woodpecker 5 (1N, 1P); White-breasted Nuthatch, 5 (2P); Acadian Flycatcher, 4 (1½M); Am. Crow, 3 (1P); Blue Jay, 3 (1P); Robin, 3 (1P); Crested Flycatcher, 3 (1M); Yellow-throated Vireo, 3 (1M); Kentucky Warbler, 3 (1M); Scarlet Tanager, 1 (½M); Eastern Towhee, 1 (½P). TOTAL: 16 species; density 126 pairs per 100 acres. REMARKS: Both Hairy Woodpeckers and Yellow-shafted Flickers were noted in the area but they apparently nested outside of it. A Veery was singing on May 28, but was not noted on later trips. The area was within the hunting territory of a Broad-winged Hawk.—HAVEN KOLB, Baltimore, Md.

19. Oak-Pine Forest. AREA: 15 acres (rectangular, 110 yards by 660 yards). LOCATION: On drainage of Back Creek, one mile north of VFW Youth Camp, Jones Springs, West Virginia. ELEVATION, 600 ft. VEGETATION: A mixed oak-pine association which has been lightly timbered, probably in 1948. Various species of oaks, as Scarlet Oak (*Quercus coccinea*), Black Oak (*Q. velutina*), White Oak (*Q. alba*), Swamp White Oak (*Q. bicolor*), Scrub Oak (*Q. ilicifolia*), Pitch Pine (*Pinus rigida*), and Scrub Pine (*P. virginiana*) make up approximately 75% of the tree and shrub layers. Other species of trees include Black Walnut (*Juglans nigra*), Elm (*Ulmus fulva*), Red Maple (*Acer rubrum*), Hickory (*Hicoria* sp.), Sassafras (*Sassafras variifolium*), Wild Cherry (*Prunus serotina*), Black Locust (*Robinia pseudo-acacia*), Black Gum (*Nyssa sylvatica*), Willow (*Salix* sp.), Large-toothed Aspen (*Populus grandidentata*), and Sycamore (*Platanus occidentalis*). Shrubs include Mountain Laurel (*Kalmia latifolia*), Andromeda (*Andromeda floribunda*), Elder (*Sambucus canadensis*), Poison Ivy (*Rhus toxicodendron*) and Honeysuckle (*Lonicera japonica*). COVERAGE: June 14-18; 27 man-hours. CENSUS: Hooded Warbler, 47 (7P); Red-eyed Vireo, 40 (6P); Indigo Bunting, 30 (4½P); Eastern Towhee, 30 (4½P); Carolina Wren, 27 (4P); Pine Warbler, 27 (4P); Yellow-breasted Chat, 27 (4P); Blue-gray Gnatcatcher, 24 (3½P); Black and White Warbler, 20 (3P); Cardinal, 20

(3P); Carolina Chickadee, 17 (2½P); Scarlet Tanager, 17 (2½P); Downy Woodpecker, 13 (2P); Tufted Titmouse, 13 (2P); Summer Tanager, 13 (2P); Eastern Wood Pewee, 10 (1½P); Wood Thrush, 10 (1½P); Eastern Phoebe, 7 (1P); Yellow-throated Vireo, 7 (1P); Worm-eating Warbler, 7 (1P); Cerulean Warbler, 7 (1P); Prairie Warbler, 7 (1P); Louisiana Water-thrush, 7 (1P); Am. Redstart, 7 (1P); Chipping Sparrow, 7 (1P); Hairy Woodpecker, 3 (½P); Crested Flycatcher, 3 (½P); Ruby-throated Hummingbird, + (+P); Yellow-shafted Flicker, + (+P); Acadian Flycatcher, + (+P); White-breasted Nuthatch, + (+P). TOTAL: 31 species; 443 pairs per 100 acres. VISITORS: Nighthawk, Chimney Swift, Pileated Woodpecker, Barn Swallow, Blue Jay, Am. Crow, Cedar Waxwing, Brown-headed Cowbird, and Am. Goldfinch observed flying overhead.—W. R. DeGarmo, Conservation Commission, Charleston, W. Va.

20. Southern Upland Oak-Pine Woodland. SIZE: 25 acres. L-shaped, shrubbiest and most uniform part of the 50-acre tract used for a wintering census earlier this year. LOCATION: On crest of a chert ridge known as Flint Ridge, one mile south of Fairfield, Alabama, a suburb of Birmingham. Tract is in the northwestern corner of section 23, T18S, R4W on U. S. Geol. Surv. map of Bessemer Iron District, Alabama. DESCRIPTION: Gently rolling, sloping from northwest to southeast, cut by several gullies which are wet only in wet weather; elev., 600 ft. Fairly mature second-growth woodland with three or four openings in the crown and approximately one dead tree per acre. Tree holes of all sizes are very common. The following percentages of trees were determined by counting a total of 1300 trees on two lines, one the hill-crest 1200 ft. and the other 1200 ft. along a gully: Black Oak (*Quercus velutina*), 17%; Hickory (*Carya alba, glabra* and *ovata*), 15%; Yellow or Short-Leaf Pine (*Pinus echinata*), 14%; Southern Red Oak (*Q. falcata*), 11%; Spruce Pine (*P. virginiana*), 9%; Post Oak (*Q. stellata*), 9%; Black Gum (*Nyssa sylvatica*), 6%; Sweet Gum (*Liquidambar styraciflua*), 5%; Blackjack Oak (*Q. marilandica*), 4%; Dogwood (*Cornus florida*), 3%; Persimmon (*Diospyros virginiana*), 2%; White Oak (*Q. alba*), 1.5%; Loblolly Pine (*P. taeda*), 1%; Hawthorn (both *Crataegus* and *Viburnum*), 1%; Hackberry (*Celtis occidentalis*), .5%; miscellaneous, 1%. The understory consists of about 50% saplings of the dominants with higher proportions of gums, dogwood and persimmon and lower proportion of oaks. Commonest shrubs are: French mulberry (*Callicarpa americana*), Muscadine (*Vitis rotundifolia*) and other grapes (*Vitis* sp.), Southern Buckhorn (*Bumelia lycioides*), Smilax (*Smilax* several sp.), Honeysuckle (*Lonicera japonica*), Gopherberry (*Gaylussacia dumosa*), Sparkleberry (*Batodendron arboreum*), Blueberry (*Vaccinium* sp.). *Monograph* 9 *and* 10 *of the Geological Survey of Alabama* by Roland M. Harper used for identification and scientific names of woody plants. EDGE: Surrounded by similar woodland which was a little drier and less shrubby than the study tract. COVERAGE: 14 trips as follows: Mar. 29; Apr. 5, 11, 15, 19, 21, 25, 28; May 6, 16, 27; June 17; July 8; Aug. 13; two to four hours per trip, and mostly between 6 and 10 a.m.; one night trip, 6:30-8:30 p.m. was fruitless and is not counted above. WEATHER: Winter very wet and very warm; early spring cool in spells, averaging normal; precipitation deficiencies in every month from March on: last light frost, April 17, was quite late as foliage was out over two weeks. CENSUS: Red-eyed Vireo, 52 (6Y, 7P); Blue Jay, 28 (1NY, 4Y, 2P); Pine Warbler, 20 (1NY, 3Y, 1P); Tufted Titmouse, 12 (2Y, 1P); Wood Thrush, 12 (3P); Blue-gray Gnatcatcher, 12 (1NY, 2Y); Kentucky Warbler, 12 (1NY, 2Y); Cardinal, 12 (+3Y); Downy Woodpecker, 8 (2Y); Acadian Flycatcher, 8 (2P); Carolina Chickadee, 8 (1Y, 1P); Yellow-throated Vireo, 8 (1NY, 1N); Indigo Bunting, 8 (2Y); Summer Tanager, 6 (1.5P); Eastern Towhee, 6 (1.5P); Yellow-billed Cuckoo, 5 (1.3P); Red-shouldered Hawk, 4 (1NY); Crested Flycatcher, 4 (1P); Carolina Wren, 4 (1N); Field Sparrow, 4 (1Y). TOTAL: 20 species; density, 233 pairs per 100 acres. VISITORS (average number of individuals per 100 acres): Pileated Woodpecker, 4; Red-bellied Woodpecker, 4; Wood Pewee, 4; Am. Crow, 24; White-breasted Nuthatch, 4; Carolina Wren, 4; Am. Goldfinch, 8. REMARKS: Two pairs of Hooded Warblers established themselves in the area but disappeared sometime between May 6 and 16 after being present over a month. I had a similar experience on another dry tract nearby in 1947. Birds of dry open woods which bred nearby but were not recorded on the tract include: Red-headed Woodpecker, Eastern Bluebird, Prairie Warbler, Pine-woods Sparrow and Chipping Sparrow. The presence of Indigo Bunting and Field Sparrow were undoubtedly due to the breaks in the forest crown. This tract is 7 miles southwest along practically the same ridge as the tract used in censuses in 1947 and 1948. Apparently the difference in densities between the two tracts is attributable to the pines. Both of the nests of Yellow-throated Vireos were in Yellow or Short-leaf Pine. The absence of the Yellow-throated Warbler, a very common breeder in the region and a common migrant through the tract, probably indicates that it requires more than 1% Loblolly Pine. The Pine warblers had young out of the nest before April 11. No record was kept of those pairs having second broods.—Thomas A. Imhof, 307 38th Street, Fairfield, Ala. (Birmingham Audubon Soc.).

21. Pond and Border. An area (15.3 acres) of briers, thorns, and small trees with 4½ acres of water and 2½ acres of cattails in the North Chagrin Metropolitan Park ten miles east of the city limits of Cleveland, Ohio. This is the seventh year of the census. The area was fully described in 1946. COVERAGE: Constant April through August. CENSUS: Red-wing, 170 (26EP-40N, 13Y); Catbird,

52 (8N); Alder Flycatcher, 46 (5N, 2P); Song Sparrow, 39 (6P); Yellow Warbler, 39 (2N, 4P); Robin, 33 (5N); Yellow-throat, 26 (4P); Field Sparrow, 26 (2N, 2P); Cedar Waxwing, 20 (3P); Blue-winged Warbler, 13 (2P); Goldfinch, 13 (2P); Mallard, 10 (1½EP-1N, 1Y); Mourning Dove, 7 (1P); Baltimore Oriole, 7 (1P); Brown Thrasher, 7 (1N; Eastern Towhee, 7 (1P); Blue Jay, 7 (1P). TOTAL: 17 species; density, 522 pairs per 100 acres. REMARKS: A pair of Canada Geese, probably from a neighboring estate, came in and made a nest. There were 2 eggs on April 11, 4 on the 14th and 5 on April 18. All hatched on May 14, all survived and stayed in the pond until July 29. The geese and the unusually hot May brought crowds who trampled the grass near the park benches and for the first time, no Song Sparrow nested there. One female Mallard raised 3 young from the 11 hatched and another had 5 survive out of 10. Apparently there was only one male Mallard and he came in briefly the first and second day after the first brood came off and was not seen after that. As in other years, the Red-wing nests (40 this year) were destroyed when they contained eggs, not young. No Cowbirds were present this year. VISITORS: Barn Swallows, Chimney Swifts, and one Belted Kingfisher.—VERA CARROTHERS, E. Cleveland, Ohio.

22. Pond and Wet, Sparsely-wooded Meadow. About 18 acres of meadow, mostly wet, in places inundated; pond of about seven acres bordered by cattail-rush-smartweed community lightly interspersed with rose, willow, and buttonbush brush. North periphery of wet area supports elm, willow, and hazel scrub while higher and drier parts have thin stands of sumac, hickory, and sassafras. Open water 1-6 ft. deep with mud bottom. Besides cattails (*Typha latifolia*) growing from water, other aquatics are *Rumex* sp., *Ranunculus longirostris*, and *Polygonum coccineum*. Entire area grazed by 6 to 8 head of livestock. SIZE: Total area 24.6 acres of which 6.8 acres is open water. Water area fluctuates slightly with rainfall. LOCATION: NW¼, NW¼, S13, T23N, R5W, Tippecanoe County, Indiana. Area locally known as Ross's or Blackbird Pond and found 1 mile west of West Lafayette. TOPOGRAPHY: About 660 ft. above sea level, area consists of shallow basin with higher ground on east and west sides. Pond fed by intermittent stream from north and water level maintained by low earth dam just outside of study area on the south. COVERAGE: Visited April 25; May 1, 6, 12, 13, 14, 20, 27; June 3, 11, 16, 27; July 10, 16, 28, 30, with hours varying from 4:15 a.m. to 8:15 p.m. (CST) by two observers for a total of 50 man-hours of observation. WEATHER: The mean temperatures for April, May and June were slightly higher than normal (+.3° — +2°). During the first two weeks of July there was a heat wave with mean temperatures ranging +6° to +8° from normal. The rest of July was a little warmer than usual. Precipitation was –.24 to –1.45 in. from normal during April and May but during the month of June there was an increase in precipitation to +1.36 in. from normal. Despite the heavy June rains no nests observed were damaged by water. CENSUS: Red-wing 304 (76EP); Short-billed Marsh Wren, 24 (1N, 5M); E. Least Bittern, 8 (2N); Long-billed Marsh Wren, 8 (2N); Eastern Meadowlark, 8 (2N); Song Sparrow, 8 (1N, 1M); Sparrow Hawk, 4 (1N); Mourning Dove, 4 (1N); Yellow-billed Cuckoo, 4 (1N); Robin, 4 (1N); Bluebird 4 (1N); Starling, 4 (1N); Yellow-throat, 4 (1P). DENSITY: 394 birds per hundred acres (264 pairs in 1948). VISITORS: Great Blue Heron, Green Heron, Ring-necked Pheasant, King Rail, Sora, Coot, Killdeer, Upland Plover, Rock Dove, Chimney Swift, Ruby-throated Hummingbird, Belted Kingfisher, Yellow-shafted Flicker, Hairy Woodpecker, Bank Swallow, Barn Swallow, Purple Martin, Catbird, Brown Thrasher, English Sparrow, Bobolink, Purple Grackle, Cardinal, Am. Goldfinch, Grasshopper Sparrow, Field Sparrow. REMARKS: The Sparrow Hawk and Starling nested in Wood Duck boxes which were placed on the area for the first time in the spring of 1949.—ROBERT BANNER and RICHARD KIZER, Purdue University, Lafayette, Ind.

23. Upland Swamp Forest and Marsh. An area of approximately 20 acres located in the northwest corner of Portage County, Ohio, one quarter mile east of the W. & L. E. RR. and one quarter mile south of Davis Crossing Road in the southwest corner of Aurora Township; altitude 1000 ft. above sea level. Edge provided by brushy fields along the northern boundary; by the beginning of higher ground to the west, growing to hawthorn and wild apple thickets. Open fields and numerous small swampy areas of cattail, button bush, sedge and rush present. Fully described in 1946 (Census No. 12), the year of the first census. There have been no changes in the vegetational conditions normal growth, but in time the open or marsh area will support a forest of elm, red maple, swamp white oak, tupelo, etc. COVERAGE: April 5, 12, 20, 25; May 2, 9, 16, 21, 25, 31; June 2, 6, 9, 20, 23, 27; July 8, 15; August 9, 15, 18. Hours varied from 5:30 a.m. to 7:30 p.m. (EST), and totaled approximately 77. WEATHER: As general in the East the winter was extraordinarily mild and open with little snow of which almost one half came in March. There were no storms of destructive character. April was warm with normal rainfall in this area and May continued so with excessive rainfall. June, July and August remained unusually warm to the 15th, but while nearby areas suffered from lack of rain, there were frequent storms and showers over most of the township. The Cleveland Weather Bureau reports an accumulated excess of temperature of 1713 degrees and a deficit of .54 in. of precipitation since a year ago on August 18. CENSUS: Mallard, 5 (1N); Ruby-throated Hummingbird, 10 (2P); Hairy Woodpecker, 5 (1N); Downy Woodpecker, 5 (1P);

Crested Flycatcher, 5 (1N); Eastern Wood Pewee, 10 (1P, 1N); Black-capped Chickadee, 10 (2PY); Tufted Titmouse, 5 (1N); White-breasted Nuthatch, 2½ (½P); House Wren, 5 (1N); Catbird, 30 (1P, 5N); Wood Thrush, 17½ (3½N); Veery, 5 (1P); Red-eyed Vireo, 5 (1P); Blue-winged Warbler, 2½ (½P); Yellow Warbler, 30 (6N); Cerulean Warbler, 5 (1P); Northern Water-thrush, 10 (2P); Yellow-throat, 5 (1P); Am. Redstart, 10 (1P, 1N); Brown-headed Cowbird, 10 (2EP); Scarlet Tanager, 10 (1P, 1N); Cardinal, 10 (2N); Eastern Towhee, 5 (1P); Swamp Sparrow, 10 (1P, 1N); Song Sparrow, 45 (8P, 1N). TOTAL: 26 species; density 272 pairs per 100 acres (405 in 1946 and 305 in 1947; not censused in 1948). FREQUENT VISITORS: Great Blue Heron, Green Heron, Wood Duck, Turkey Vulture, Sharp-shinned Hawk (nest 25 yards west), Red-shouldered Hawk, Marsh Hawk, Woodcock, Yellow-billed Cuckoo, Yellow-shafted Flicker, Pileated Woodpecker, Eastern Phoebe, Carolina Wren (one pair in area 8/9; unusual) Eastern Bluebird, Yellow-throated Vireo, Oven-bird, Yellow-breasted Chat (one record), Redwing, Rose-breasted Grosbeak (nest 30 yards west). REMARKS: With respect to the White-breasted Nuthatch and one pair of Wood Thrushes, nests were found within 5 yards of the edge of the area surveyed and have been counted as one-half pair. The Blue-winged Warbler nest was not found but the birds were in the territory at all times near the edge and have also been counted as one-half pair. Present in 1947 but missing this year were: Yellow-billed Cuckoo, Robin, Cedar Waxwing, Yellow-breasted Chat, and Am. Goldfinch. New species were Crested Flycatcher (present in 1946), Blue-winged Warbler, and Cerulean Warbler.—CARL F. HAMANN, Aurora, Ohio.

24. Open Hemlock-Spruce Bog. SIZE: 9½ acres. LOCATION: Cranesville bog, Maryland; 8 miles north-northwest of Oakland, Garrett County. A remote glade toward the southeastern edge of the bog, and not visible from surrounding upland. Elevation 2550 ft. EDGE: Surrounded by a dense growth of spruce and hemlock with nearly impenetrable undergrowth of rhododendron. VEGETATION: The central portion of the study area is covered with sedges (principally *Carex stricta*) and mosses (including a deep carpet of *Sphagnum* and much haircap moss, *Polytrichum* sp.). Scattered through this open area are clumps of Hemlock (*Tsuga canadensis*) and Red Spruce (*Picea rubens*) averaging 10 ft. in height. Shrubs and saplings present in smaller numbers include Serviceberry (*Amelanchier* sp.), Canada Blueberry (*Vaccinium canadense*), Speckled Alder (*Alnus incana*), American Elder (*Sambucus canadensis*), Mountain Ash (*Sorbus americana*), Withe-rod (*Viburnum cassinoides*), and Pitch Pine (*Pinus rigida*), Swamp Dewberry (*Rubus hispidus*) and Creeping Snowberry (*Chiogenes hispidula*) are conspicuous under foot. Numerous tongues of the surrounding bog forest extend into the glade, and these, together with the evergreen clumps and the adjoining hemlock-spruce forest are responsible for the great variety and abundance of avian life. COVERAGE: May 29; June 11, 12, 25. Total: 10 trips, 7 hours. CENSUS: Northern Water-thrush, 84 (1P, 7M); Catbird, 74 (3P, 4M); Magnolia Warbler, 63 (6M); Song Sparrow, 32 (1Y, 1P, 1M); Robin, 21 (1N, 1Y); Nashville Warbler, 21 (1Y, 1P); Black-throated Green Warbler, 21 (2M); Yellow-throat, 21 (1P, 1M); Canada Warbler, 21 (2M); Swamp Sparrow, 21 (1Y, 1M); Cedar Waxwing, 16 (1½P); Yellow-shafted Flicker, 11 (1P); Veery, 11 (1P); Blackburnian Warbler, 11 (1P); Purple Finch, 11 (1N); Am. Goldfinch, 11 (1M); Crested Flycatcher, 5 (½); Blue Jay, 5 (½P); Black-capped Chickadee, 5 (½M); Parula Warbler, 5 (½M); Black-throated Blue Warbler, 5 (½M); Yellow-billed Cuckoo, 3 (¼); Brown-headed Cowbird, 3 (¼); Horned Owl, +; Rose-breasted Grosbeak, +. TOTAL: 25 species; 482 pairs per 100 acres. VISITORS: Great Blue Heron, 1P; Turkey Vulture, flying over; Mourning Dove, 4P; Hairy Woodpecker; Downy Woodpecker; Barn Swallow, flying over; Am. Crow; Brown Thrasher; Black and White Warbler; Eastern Meadowlark; Eastern Towhee; Scarlet Tanager. COMMENT: This area was selected for study in spite of its small size, because it is the best example of this habitat in Maryland. Although it must be classed as a mixed habitat because it is dominated by edge effect, the very presence of the high percentage of edge attracts a bird population not encountered in any pure habitat in this region. The two pairs of Nashville Warblers recorded in this area are the only ones known to nest in Maryland. Although the Purple Finch occurs sparingly in several Garrett County bogs, the present census furnished the first actual nest record for the State. The most typical bird of the hemlock-spruce edge was the Northern Water-thrush, which appeared in much higher density here than in the forest itself. No less than 13 pairs had territories at least partly within the study area; but by restricting the area to include only the open bog and the immediately adjoining edge, many territories of the Water-thrush were partially excluded from the census area. The distribution of the Magnolia Warbler followed a pattern similar to that of the Water-thrush. The Catbird, which was nearly as abundant as the Water-thrush, was less restricted to the forest edge, and was frequently found in the shrubs and saplings throughout the area. The Song Sparrow, Yellow-throat, and Swamp Sparrow were the only species restricted to the purely open area. The Flicker and Crested Flycatcher owed their presence to a few dead trees; other species such as the Downy and Hairy Woodpeckers which are listed merely as visitors may have nested on the area earlier in the season. Mourning Doves were common in the adjoining forest and frequently flew back and forth across the open area. Robert E. Stewart recorded a Hermit Thrush in this area in July, 1948.—CHANDLER S. ROBBINS, Patuxent Research Refuge, Laurel, Md.

25. Semi-Wooded River Bottom Pasture Land. About 40 acres of lightly grazed pasture land, located between the north bank of Clear Creek and interurban tracks, and being equally divided by Clear Creek Road, 6 miles west of Denver. Scattered trees over the whole area, except 3 large grass openings. Crossed by a slough with running water. About 5 acres of open gravel flat. All original growth. 300 yds. of cattail beds. Similar habitat on all sides. VEGETATION: 50% Plains Cottonwood (*Populus sargentii*), 25% Black Willow (*Salix lasiandra*), 10% Narrow-leaf Cottonwood (*Populus angustifolia*), 10% Mt. Mahogany (*Cercocarpus montanus*), 5% Sage Brush (*Artemisia tridentata*). Scientific names from Preston's *Rocky Mt. Trees*. COVERAGE: May 11, 14, 20; June 4, 10, 16, 17; July 3, 11. Hours varied from 7 a.m. to 4 p.m. and totaled 60. CENSUS: Am. Magpie, 25 (6N, 3P, 1Y); Red-wing, 17 (2N, 5P); Red-shafted Flicker, 17 (4N, 2P, 1Y); House wren, 15 (2N, 3M, 1Y); Robin, 10 (2N, 2M); Mourning Dove, 8 (3N); Lewis's Woodpecker, 5 (1N, 1P); Sparrow Hawk, 3 (1N); Killdeer, 3, (1P). TOTAL: 9 species; density, 103 prs. per 100 acres. COMMON VISITORS: Western Flycatcher, Wilson's Snipe, Audubon's Warbler, Olive-sided Flycatcher, Yellow-throat, Lazuli Bunting, and Yellow Warbler. OCCASIONAL VISITORS: Bullock's Oriole, Sora, Western Tanager, Black-headed Grosbeak, Black-capped Warbler, Olive-backed Thrush, Starling, Black-throated Gray Warbler (observed at length by 9 members of the Colorado Bird Club), Brown Thrasher, Solitary and Warbling Vireos, and White-crowned Sparrow.—VIRGIL C. ROSENBAUM, 2825 W. 29th Ave., Denver, Colo.

26. Dryland Field, Irrigated Field and Edge. This area was composed of about 15% dryland field, 25% permanent cover and 60% irrigated fields. The crop types were Wheat, Alfalfa (*Medicago sativa*) and Barley (*Hordeum vulgare*). The permanent cover was composed of Plains Cottonwood (*Populus sargentii*), Lanceleaf Cottonwood (*P. acuminata*), Narrowleaf Cottonweed (*P. angustifolia*), Peachleaf Willow (*Salix amygdaloides*), Narrowleaf Willow (*S. exigua*), Rabbitbrush (*Chrysothamus* spp.), Russian Thistle (*Salsola pestifer*). Firewced (*Kochia scoparia*), Lamb's Quarters (*Chenopodium* spp.), Green Foxtail (*Setaria viridis*) and others. The trees average about 70 ft. in ht. and about 2.5 ft. DBH, the shrubs about 8 ft. in height. Scientific names of trees taken from Preston's "North American Trees," others from Coulter and Nelson's "Manual of Rocky Mountain Botany." SIZE: 25 acres. LOCATION: About 6.5 miles east and 3 miles south of Fort Collins, Colorado. The tract was bounded on two sides by mixed habitats, on one side by permanent cover and on one side by dryland wheat. TOPOGRAPHY: Fairly level; elevation, about 4900 feet. COVERAGE: Same as above except hours totaled 32. CENSUS: Mourning Dove, 32 (7N, 1P); Am. Magpie, 24 (6N); Red-wing, 20 (5EP); Western Meadowlark 14. (2N, 1.5P); Mallard, 8 (2N); Bullock's Oriole, 8 (2P); Rough-winged Swallow, 8 (2N); Yellow-throat, 8 (2P); Ring-necked Pheasant, 6 (1.5EP); Red-shafted flicker, 4 (1P); Eastern Kingbird, 4 (1P); Brown thrasher, 4 (1P). TOTAL: 12 species; density, 140 pairs per 100 acres. VISITORS: Great Blue Heron, Black-crowned Night Heron, Blue-winged Teal, Cinnamon Teal, Sparrow Hawk, Killdeer, Avocet, Ring-billed Gull, Rock Dove, Am. Crow, Veery. REMARKS: One Mallard nest was found 16 ft. up in a cottonwood tree on the study area. The hen was later killed by a predator; the nest was then examined and 7 eggs were found, 5 of which had been broken, 1 was infertile, and 1 egg contained a 2 week's embryo. One pheasant nest was abandoned and the eggs destroyed by predators (probably magpie).—MEREDITH J. MORRIS, ZOOLOGY Dept., Colorado A & M College, Fort Collins, Colo.

27. Ponderosa Pine, Brush and Grassland. This census was made on a tract of 40 acres, as determined by plane-table mapping. It is a steep hillside culminating in a rocky ridge, located approximately 6 miles west of Fort Collins, Colorado, at an elevation of 5500 ft. This area was selected because a series of dams recently constructed will, in 1951, cause a few of the acres to be under water. The area is situated about equal distance between Spring Canyon Dam and Soldier Creek Dam on the west slope of the reservoir. An abandoned wagon trail and some old mine diggings serve as good land marks for the area. The area is of 3 distinct vegetative types; about 15 acres of Ponderosa Pine (*Pinus ponderosa*) are found along the ridge; below the above area is a narrow strip, about 5 acres, of brush made up chiefly of Choke Cherry (*Prunus melanocarpa*) and False Raspberry (*Bossekia deliciosa*). The lowermost portion of the area is primarily grassland with some of the more prominent species being, Mountain Mahogany (*Cercocarpus* sp.), Yucca (*Yucca glauca*), Phlox (*Phlox longifolia*), Larkspur (*Delphinium* sp.), Death Camas (*Zygadenus elegans*), Columbine (*Aquilegia* sp.), Anemone (*Anemone* sp.), Pasque Flower (*Pulsatilla hirsutissima*), and Violet (*Viola nuttallii*). Botanical nomenclature above from *New Manual of Rocky Mountain Botany*, by Coulter and Nelson, 1909, and *Rocky Mountain Trees*, by Preston, 1940. COVERAGE: May 15, 21, 26; June 1, 7, 12, 19, 25, 1949. Total 35 hours. WEATHER: The mean temperature for the months of January and February was lower than usual. The precipitation for the month of June was 4 in. above the mean. CENSUS: Am. Magpie, 10 (4Y); Lark Sparrow, 10 (2P, 1N, 1Y); Spotted Towhee, 7.5 (2N, 1Y); Mourning Dove, 5 (2N); Western Meadowlark, 5 (1P, 1N); Lazuli Bunting, 5 (2N); Sparrow Hawk, 2.5 (1P). TOTAL: 7 species, 18 pairs. DENSITY: 45 pairs per 100 acres. FREQUENT VISITORS: Violet-green Swallow, 2P; Red-tailed Hawk, 1; Say's Phoebe, 1; Am. Crow, 1P. INFREQUENT VISITORS: Mountain

Bluebird and Western Tanager.—PAUL J. LAWHEAD, Rt. 23, Box 514, Fort Collins, Colo.

28. Shrubby Field and Forest Edge. SIZE: About 60 acres. LOCATION: The greater part of the field area of the Bird Haven Sanctuary in Richmond Co., Olney, Illinois. A nearly rectangular field with a cover of grass and many native wild flowers such as Black-eyed Susans (Rudebeckia), monardas, a variety of goldenrods, asters, and sunflowers along with a variety of shrubs such as Pasture Rose, Smooth Sumac, an abundance of blackberries, dew berries, and such woody climbers as Trumpet Creepers and Poison Ivy. A small stream runs the length from north to south dividing the area into nearly equal parts. Trees line the stream, dot the open areas and border the east and west sides for about ⅓ of the distance from the north end. The Honey Locust is the most common tree in the east-west border with a few Redbuds, several pines and seedling maples. Along the stream the American Elm, maple, ash, willow and Red Cedar predominate. The surface is irregular, with many hills, small valleys, and the south end is a marsh in early spring and during the period of heavy rains in the spring and summer. This section was not included in the study. The north edge of the study area is bordered by a gravel road with a pasture field on the north of the road. Cultivated fields mark the boundary on the east and west. COVERAGE: March 24; April 7, 21, 30; May 2, 16, 25, 30; June 3, 9, 15, 24, 30; July 4, 15, 21, 28; Aug. 8, 15. One night trip in late April and again in early May. Total time spent about 150 hours. CENSUS: Field Sparrow, 17 (4Y, 2N, 3P, 1M); Indigo Bunting 10 (3M, 3P); Cardinal, 8 (2Y, 3N); Yellow-breasted Chat, 8 (4M, 1UM); Eastern Towhee, 5 (2M, 1P); Am. Goldfinch, 5 (2N, 1M); Carolina Wren, 3 (2Y); Bell's Vireo, 3 (2M); Orchard Oriole, 3 (2Y); chickadee, 3 (2Y); Brown Thrasher, 1 (1P); Downy Woodpecker, 1 (1M); Cedar Waxwing, 1 (1N); cuckoo, 1 (1M); Red-shouldered Hawk, 1 (1M) (nest was in woods to the east of the area covered by report, but came to feed and try to drive intruders off); Red-bellied Woodpecker, 1 (1UM) (came to dead tree to feed); Green Heron, 1 (1UM) (was seen once, July 15, resting in trees along west side of wooded edge); Pine-woods Sparrow, 1 (1UM) (seen only once during the census period along north fence where it flew to the pasture field across the road). TOTAL: 18 species; density, 83 pairs per 100 acres.—PERNA M. STINE, Olney, Ill.

29. Open Mixed Hardwoods With Grassy Clearings. About 20 acres of open, lightly-grazed woodlot, with thick, rapidly growing undergrowth and 2 grass openings of 2½ and 1½ acres. LOCATION: Three miles north of Lexington, Virginia. First censused in 1944, and fully described in 1945. COVERAGE: March 28; April 2, 11, 18; May 5, 9, 16, 23, 28, 30; June 3, 18, 24; July 1, 4, 6, 7, 8, 9, 10, 12, 13, 14. TOTAL: 36 hours. WEATHER: Spring normal, except for early warm spells; June, hot and dry; July, hot and humid. Continued spread of *Eleagnus* sp. CENSUS: Field Sparrow, 60 (2N, 6Y, 4P); Cardinal, 45 (4N, 2Y, 3P); Indigo Bunting, 30 (1N, 2Y, 3P); Blue-gray Gnatcatcher, 25 (1N, 4P); Yellow-breasted Chat, 25 (3N, 1Y, 1P); Carolina Chickadee, 20 (1N, 2Y, 1P); Brown-headed Cowbird, 20 (4P); Yellow-billed Cuckoo, 17.5 (.5Y, 3P); Eastern Wood Pewee, 17.5 (1N, 2.5P); Downy Woodpecker, 15 (1Y, 2P); Carolina Wren, 15 (2Y, 1P); Am. Goldfinch, 15 (3P); Chipping Sparrow, 15 (1N, 2P); Red-eyed Vireo, 12.5 (1N, 1.5P); Prairie Warbler, 12.5 (1Y, 1.5P); Ruby-throated Hummingbird, 10 (2P); Eastern Phoebe, 10 (1N, 1P); Acadian Flycatcher, 10 (1N, 1P); Tufted Titmouse, 10 (1N, 1Y); Yellow-throated Vireo, 10 (1Y, 1P); Black and White Warbler, 10 (1Y, 1P); Cerulean Warbler, 10 (2Y); Oven-bird, 10 (1Y, 1P); Summer Tanager, 7.5 (1.5P); Bob-white, 5 (1P); Screech Owl, 5 (1Y); Crested Flycatcher, 5 (1Y); White-breasted Nuthatch, 5 (1P); Brown Thrasher, 5 (1N); Eastern Bluebird, 5 (1P); Starling, 5 (1Y); Worm-eating Warbler, 5 (1Y); Parula Warbler, 5 (1Y); Yellow-throat, 5 (1P); Hooded Warbler, 5 (1N); Am. Redstart, 5 (1Y); English Sparrow, 5 (1N); Blue Grosbeak, 5 (1N); Eastern Towhee, 5 (1P); Song Sparrow, 5 (1Y). TOTAL: 40 species; density, 512 pairs per 100 acres (530 in 1944, 560 in 1945, 570 in 1946, 525 in 1947, 480 in 1948). FREQUENT VISITORS: Wood Duck, Turkey Vulture, Chimney Swift (roosted in cabin chimney, but did not nest), Belted Kingfisher, Pileated Woodpecker, Red-bellied Woodpecker, Yellow-shafted Flicker, Am. Crow, Mockingbird, Catbird, Robin (large flocks in late summer, feeding on *Eleagnus* berries), English Sparrow, Baltimore Oriole, Orchard Oriole. An unmated male Red-headed Woodpecker was present through the early summer. The Carolina Wren has not yet recovered from losses of 1947-1948 winter. The male Blue Grosbeak was a first-year breeder, different from the old male of 1948.—J. J. MURRAY, Lexington, Va.

30. Oak-Hickory Forest, Pine Stand and Edge. An area of approximately 35 acres, located in Eden Township, Licking County, Ohio; censused as in previous years and more fully described in earlier reports. The census tract contains upland oak-hickory woods, a mixed mesophytic woodland on the valley slope, a spruce area, a small pine stand of about 3 acres, a pine-spruce-hemlock nursery (1500 sq. ft.), a pond, three small clearings, and a narrow section of grassy bottomland including a cold, spring-fed bog of several hundred square feet. The census area is a Boy Scout camp with several buildings entering into the ecology of the bird population. A new storehouse was erected in the spruce section along the eastern spruce-meadow edge removing about 1000 sq. ft. of ground area. Since the building is low, it does not block any portion of the spruce edge. A second major change in the census area was the clearing of alder and other

vegetation along an edge of about 300 ft. immediately south of the pool. This change brings more sunlight into the bog area and moves the forest edge westward several feet. A third change in the census area was the erection of about 2000 ft. of electric wire which follows the eastern edge for about two-thirds of its length. As quickly as it was erected it was incorporated into the territorial behavior patterns of the edge species. Other minor changes include the spreading of excavated earth adjacent to the storehouse, the removal of spruce number five, a small number of dead saplings blown down, and a few spruce limbs trimmed to clear the electric line. Two bird houses erected in the summer of 1948 remained unoccupied. EDGE: Modified by the changes previously mentioned. COVERAGE: March 26; April 16, 23, 30; May 26, 27, 28, 29, 30, 31; June 3, continuous presence from 2 p.m. June 8 to 5 p.m. June 11; continuous presence from 2 p.m. June 16 to 10 a.m. June 18; July 3 and 4; totaling 210 hours. CENSUS: Red-eyed Vireo, 31 (7N, 1P); Wood Thrush, 20 (7N); Acadian Flycatcher, 14 (5N); Mourning Dove, 11 (4N); Eastern Phoebe, 11 (4N); Eastern Wood Pewee, 11 (4P); Cerulean Warbler, 11 (4P); Oven-bird, 11 (N, 3P); Scarlet Tanager, 11 (N, 3P); Ruby-throated Hummingbird, 9 (N, 2P); Robin, 9 (3N); Cardinal, 9 (3N); Downy Woodpecker, 6 (N, P); Carolina Chickadee, 6 (2P); Tufted Titmouse, 6 (N, P); Carolina Wren, 6 (2N); Blue-gray Gnatcatcher, 6 (2P); Yellow-throated Vireo, 6 (2P); Kentucky Warbler, 6 (2Y); Brown-headed Cowbird, 6 (2P); Indigo Bunting, 6 (N, P); Chipping Sparrow, 6 (2N); Yellow-billed Cuckoo, 3 (P); Black-billed Cuckoo, 3 (P); Screech Owl, 3 (P); Hairy Woodpecker, 3 (P); Crested Flycatcher, 3 (P); Blue Jay, 3 (N); Am. Crow, 3 (N); White-breasted Nuthatch, 3 (P); Catbird, 3 (N); Black and White Warbler, 3 (Y); Louisiana Water-thrush, 3 (P); Yellow-throat, 3 (N); Summer Tanager, 3 (P); Field Sparrow, 3 (N); Song Sparrow, 3 (N). Total: 37 species; density, 260 pairs per 100 acres. REGULAR VISITORS: Ruffed Grouse, 1P; Yellow-billed Cuckoo, 1P; Black-billed Cuckoo, 1P; Whip-poor-will, 1P; Chimney Swift, 2P; Ruby-throated Hummingbird, 1P; Pileated Woodpecker, 1P; Downy Woodpecker, 1P; Acadian Flycatcher, 3P; Eastern Wood Pewee, 2P; Am. Crow, 2P; Carolina Chickadee, 1P; Tufted Titmouse, 1P; Wood Thrush, 2P; Cedar Waxwing, 2P; Catbird, 1P; Red-eyed Vireo, 3P; Cerulean Warbler, 2P; Oven-bird, 1P; Louisiana Water-thrush, 1P; Scarlet Tanager, 2P; Am. Goldfinch, 1P; Song Sparrow, 1P. IRREGULAR VISITORS: Great Blue Heron, Green Heron, Cooper's Hawk, Red-tailed Hawk, Red-shouldered Hawk, Broad-winged Hawk, Spotted Sandpiper, Horned Owl, Barred Owl, Belted Kingfisher, Yellow-shafted Flicker, Red-bellied Woodpecker, Eastern Kingbird, Barn Swallow, Bank Swallow, Warbling Vireo, Yellow Warbler, Red-wing, Baltimore Oriole, Henslow's Sparrow, Pine-woods Sparrow. COMMENTS: The density level established in 1947 continued this year. The Wood Thrush and Red-eyed Vireo attained peak densities while several species dropped by one pair and the Cardinal by two pairs (5 in 1948 to 3 in 1949). Only a few owl pellets were collected. In contrast to 1948 in which no observed mortality was recorded one adult Phoebe and 22 fledglings were lost. Of the latter, 14 were accounted for by predators, 4 by camp workers and 1 by accidental causes including the adult Phoebe. The Blue Jay was observed on one occasion to drive off a female Catbird and a young Blue Jay when banded was found to be stuffed with eggs of the Cowbird and Red-eyed Vireo. Cowbird eggs were found in two Red-eyed Vireo nests, Song Sparrow nest and Oven-bird nest in addition to which one young Cowbird was observed being fed by Kentucky Warblers.—A. H. Claggs, 209 Maholm St., Newark, Ohio.

31. Oak-Hickory-Pine Forest and Brushy Field. A 24-acre mature forest tract including a 1 ½-acre brushy field. LOCATION: Danridge Farm in Shepherdstown, Berkeley Co., West Virginia. Described in detail previously (*Audubon Magazine*, Section II, September-October, 1942, p. 29). CENSUS: Red-eyed Vireo, 46 (11P); Crested Flycatcher, 25 (6P); Wood Thrush, 25 (6P); Carolina Chickadee, 17 (4P); Tufted Titmouse, 17 (4P); Eastern Wood Pewee, 13 (3P); Scarlet Tanager, 13 (3P); Blue-gray Gnatcatcher, 8 (2P); Oven-bird, 8 (2P); Summer Tanager, 8 (2P); Cardinal, 8 (2P); Indigo Bunting, 8 (2P); Eastern Towhee, 8 (2P); Chipping Sparrow, 8 (2P); Mourning Dove, 4 (1P); Black-billed Cuckoo, 4 (1P); Whip-poor-will, 4 (1P); Am. Crow, 4 (1P); Carolina Wren, 4 (1P); Worm-eating Warbler, 4 (1P); Grasshopper Sparrow, 4 (1P); Vesper Sparrow, 4 (1P); Pine-woods Sparrow, 4 (1P); Ruby-throated Hummingbird, + (+P); Pileated Woodpecker, + (+P); Blue Jay, + (+P); Brown-headed Cowbird, + (+P). TOTAL: 27 species; density, 250 pairs per 100 acres. VISITORS: Swifts and several kinds of hawks flew over the woods, and one nest of Wood Duck was surely located there, but not found. COMMENT: Sparrows, owing I suppose to the poisoned wheat used in neighboring orchards, were much depleted in numbers.—S. K. Dandridge, Shepherdstown, W. Va.

Corrected Christmas Count Dates

DECEMBER 24 - JANUARY 2

(Deadline January 16)

* **All Birds' Names to be Capitalized** *